

# MEASURING THE NATION'S WEALTH

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MATERIALS DEVELOPED BY THE  
WEALTH INVENTORY PLANNING STUDY  
THE GEORGE WASHINGTON UNIVERSITY  
AND PRESENTED BY THE  
CONFERENCE ON RESEARCH IN INCOME  
AND WEALTH  
TO THE  
SUBCOMMITTEE ON ECONOMIC STATISTICS  
OF THE  
JOINT ECONOMIC COMMITTEE  
CONGRESS OF THE UNITED STATES



DECEMBER 1964

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## LETTERS OF TRANSMITTAL

DECEMBER 10, 1964.

*To the Members of the Joint Economic Committee:*

Transmitted herewith for use in connection with prospective hearings by the Subcommittee on Economic Statistics is a study prepared by the Wealth Inventory Planning Study of The George Washington University under a grant from the Ford Foundation entitled "Measuring the Nation's Wealth."

The Subcommittee on Economic Statistics plans to hold hearings next spring on the improvement of wealth data, primarily based on this study. The principal witnesses will be those who prepared the materials and other experts who will give their appraisal of the findings contained in the study. These materials do not necessarily reflect the views of the committee or any of its members.

Faithfully,

PAUL H. DOUGLAS, *Chairman.*

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DECEMBER 9, 1964.

HON. PAUL H. DOUGLAS,  
*Chairman, Joint Economic Committee,  
U.S. Congress, Washington, D.C.*

DEAR MR. CHAIRMAN: AS you know, the Subcommittee on Economic Statistics and other members of the Joint Economic Committee have in the past expressed considerable interest in the development of improved data on the wealth of the United States, both for some benchmark period and on a continuing yearly estimate basis. This was brought out particularly in 1962 when the Subcommittee on Economic Statistics held hearings on the measurement of productive capacity.

In June of this year, a report was released by the Wealth Inventory Planning Study, established by The George Washington University in February 1963 under a grant from the Ford Foundation. This report contains recommendations for the expansion of wealth data collection by Federal statistical agencies as a basis for continuing balance sheet and wealth estimates to supplement the national income and product accounts. Briefly stated, its purpose has been to explore the problems and possibilities of a meaningful national inventory of wealth and to develop guidelines for the collection of the requisite data and preparation of finished estimates.

This study "Measuring the Nation's Wealth" has been presented by the Conference on Research in Income and Wealth to the Subcommittee on Economic Statistics for consideration in connection with hearings the subcommittee plans to hold in the spring of 1965. The Wealth In-

ventory Planning Study group has kindly granted the committee permission to have a limited number of copies printed for the use of members of the committee, prospective witnesses, and the press preparatory to the hearings.

I am pleased to transmit this volume to the Joint Economic Committee as a background document for the subcommittee's hearings on the improvement of wealth data and estimates.

Sincerely,

WILLIAM PROXMIRE,  
*Chairman, Subcommittee on Economic Statistics.*

NOVEMBER 20, 1964.

Senator WILLIAM PROXMIRE,  
*Chairman, Subcommittee on Economic Statistics, Joint Economic Committee, Congress of the United States, Washington, D.C.*

DEAR SENATOR PROXMIRE: The Wealth Inventory Planning Study of The George Washington University has transmitted to us its report "Measuring the Nation's Wealth" for possible inclusion in the series of Studies in Income and Wealth.

The purpose of the Conference on Research in Income and Wealth has been to promote the development of income and wealth statistics, or, more broadly, national economic accounts, and their use in economic analysis. The Wealth Study report is directed precisely to these objectives, and it has seemed appropriate to the executive committee that the report of the Wealth Inventory Planning Study be published as one of the series of Studies in Income and Wealth.

Several previous volumes in the Studies in Income and Wealth series have been devoted in whole or in part to balance sheet and wealth estimation. But the Wealth Study report represents the most comprehensive review to date of the state of knowledge in this important and relatively underdeveloped area of the national accounts. We are pleased that the National Bureau of Economic Research has accepted our recommendation to distribute it as part of the Studies in Income and Wealth series so that it may be more generally and permanently available to scholars in this field.

Before the Wealth Study organization disbanded in June 1964, upon completion of its report, they mentioned to us your possible interest in holding hearings on the subject in 1965. At the request of its staff and Advisory Committee, we take pleasure in transmitting to you, with our commendation, the report of the Wealth Inventory Planning Study.

If it is the pleasure of your subcommittee to print the report as background for subsequent hearings, we should be pleased to receive permission to order additional copies of the print for distribution to our members and to make it more widely available generally as one of the Studies in Income and Wealth, as mentioned above.

In conclusion, we should like to commend the staff, Advisory Committee, and the many contributors to "Measuring the Nation's Wealth" for their part in advancing the state of this branch of economic sta-

tistics. No one can read the report without realizing the need for substantial improvements in wealth estimates, and the wide range of uses to which improved estimates may be put.

Sincerely yours,

DANIEL H. BRILL  
RICHARD A. EASTERLIN  
SIMON A. GOLDBERG  
MORRIS R. GOLDMAN  
F. THOMAS JUSTER  
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MILDRED E. COURTNEY, *Secretary,*

*Members of the Executive Committee of the Conference on  
Research in Income and Wealth.*

## MEASURING THE NATION'S WEALTH

REPORT OF THE WEALTH INVENTORY PLANNING STUDY OF THE GEORGE  
WASHINGTON UNIVERSITY, WASHINGTON, D.C., JUNE 1964

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## FOREWORD BY THE ADVISORY COMMITTEE TO THE WEALTH INVENTORY PLANNING STUDY <sup>1</sup>

Significant improvement and expansion of information relating to the wealth of the United States are both desirable and feasible. Firmly based wealth estimates, developed within a consistent framework and in reasonable detail, would enhance our ability to relate capital formation to economic growth, to project future production possibilities, and to analyze the demand for capital goods. We base these and our other broad conclusions below on the investigations of the Wealth Inventory Planning Study, which we have served in an advisory capacity over the past year.

In view of the major role of capital in nearly every facet of the economy it is not surprising that potential uses of comprehensive estimates of the Nation's capital stock are many and important, as enumerated in chapter 2 of the staff report. A principal purpose of obtaining information on wealth is to achieve a better understanding of the relationships between capital and output. While Government statistical agencies have made great progress in securing information on the supply and use of labor, they have made much less progress in providing information on the capital and land which are combined with labor to produce goods and services. The proposed wealth information would help to answer questions such as these: How is the capital stock related to a given volume of output? How large a percentage addition to the capital stock would be needed to raise the output by, say, 10 percent? How much investment would it take to increase the capital stock by any given percentage? How do these relations change over time? What is the age distribution of capital goods, and what implications does it have for their productivity?

We need better answers to these questions, both for the economy as a whole and for the different industries and sectors. With such knowledge our understanding of the underlying costs and efficiencies of our economy would be advanced. Ultimately we may hope to improve the analytical basis for comparisons in this area between the United States and other countries of the world.

Capital goods are important not only as a factor of production but also as a component of the current output of the economy. Demand for capital goods fluctuates widely. Additional data on the value and composition of the stock of capital goods, its utilization, and its age distribution would assist in studies of the demand for equipment, structures and related investment, and provide analyses of value both for business decisions and public policies.

A fuller knowledge of the allocation of our capital resources to different uses would enhance understanding of structural changes in our economy. How is capital allocated among industries, and what is

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<sup>1</sup> The views expressed are those of the Advisory Committee members and do not necessarily represent the views of the organizations with which they are affiliated.

the relation of this allocation to productivity and rates of returns? To what extent has capital accumulated outside the business sector—in governments, households, and nonprofit institutions? What are the value and location of taxable and tax-exempt property? Greater knowledge of the location of our structures and equipment would add an important dimension to regional analysis.

Major movements of capital abroad and movements from abroad into this country play a significant role in the Nation's balance of payments. Improvements of our data on the extent of such investments is of strategic value in enhancing our analysis of a particularly difficult problem of our economy.

A complete view of capital formation and a full use of data on wealth require national and sector balance sheets that combine financial data and estimates of tangible wealth on a consistent basis. These would enrich the study of capital markets and assist in the evaluation and formulation of monetary and fiscal policies.

Whether and how well these potential uses will be served depends upon the resources that can be devoted to the collection and processing of data, and upon the ingenuity that can be brought to the solution of some difficult statistical and conceptual problems.

The staff report discusses both tangible assets and financial assets and liabilities. Data for both are important, need improvement, and can and should be improved. The Advisory Committee agrees with the staff report that present information concerning tangibles—structures, equipment, land, inventories, and the like—is on the whole less satisfactory than data for financial items and deserves priority in the collection of additional data.

The Advisory Committee believes that the time is now at hand to initiate the planning and testing within the Federal statistical establishment that must precede an expansion of wealth data collection. Since the Office of Statistical Standards, Bureau of the Budget, has the responsibility for planning and coordinating Federal statistical programs, we urge it to move ahead vigorously in this field.

Neither the staff nor the Advisory Committee envisage a one-time census of wealth. Rather, the procedure suggested is to tie in the collection of wealth data with existing Federal programs. This procedure promises greater efficiency and economy than a comprehensive one-time survey. Given the reporting cycle followed by the Census Bureau, all industries could be covered over a 5-year period if it includes the year 1970, since the censuses of population and housing are taken decennially, while the industry censuses are taken quinquennially. Most of the noncensus reporting programs identified by the staff report are annual and could be fitted into the census cycle, as could surveys of industries not covered by existing programs. If the 5-year period for benchmark data collection is to include the 1970 decennial census, the necessary advanced planning, coordination, consultation, and testing must be initiated promptly.

The proposed procedure implies that the most detailed and accurate data would refer to different years in different sectors of the economy. However, these basic data, together with collateral or sample information, would be used to develop comprehensive and consistent, though less detailed, estimates for a single benchmark year, perhaps 1970. The benchmark year estimates, in turn, would be extended



annually, with periodic adjustment to new basic data as they become available for particular sectors. The annual series would also be deflated to provide estimates of the value of tangible assets in constant prices.

We wish to make it clear that respondents to census and other inquiries usually neither should nor would be expected to provide information in such a form that it could be directly incorporated into the aggregate estimates. The burden of transforming reported data into a consistent and significant whole would rest upon the responsible Federal statistical agencies. Questions to respondents should, of course, be framed to provide information in the form most useful to the estimating agencies, but only within the limits of what respondents can reasonably provide.

We can illustrate this point by reference to the valuation of tangible assets. Wealth estimates should be made in terms of current values that are approximations to market values and in terms of constant dollars. This is necessary both for valid comparisons among sectors and for consistency with gross national product valuations. Current value estimates for certain important types of tangible assets, particularly houses, can be and already are obtained from respondents. But in most cases the basic obligation of respondents would be only to report on a book-value basis, since too few could accurately report the current values of their tangibles. The estimating agency would then have the responsibility of processing these data and revaluing them. The revaluation would be carried out by use of price indexes and other associated and collateral data obtained through special studies and, where necessary and possible, from small samples of respondents.

Plans for improving collateral information such as prices and service lives of capital goods should proceed along with plans for the collection of tangible-asset data as such.

The general approach described here for relating data collection to estimation, and for use of benchmark data in continuing series, is similar to that followed in the compilation of other aggregate economic series, such as industrial production, gross national product, the flow of funds, or the balance of payments.

Proposals for collection of additional financial data to permit improvement and expansion of the financial as well as the real components of national and sectoral balance sheets merit careful attention. The suggestions of the Wealth Study staff and the Working Group on Nonfarm Business Financial Claims with respect not only to the collection of data but also to valuation and to the sector and item structure of balance sheets furnish a constructive point of departure for further progress.

The general guidelines developed in the report (see particularly the summary in ch. 12) provide a necessary background for the formulation of consistent data-collection plans, and for the subsequent preparation of wealth estimates. The Advisory Committee has not itself tried to formulate a position with respect to the detailed conclusions of the staff report as summarized in chapter 12, nor to the recommendations of the 14 sector working groups. We do recommend the entire Wealth Study report for serious consideration by all those persons, both in and out of the Federal Government who are interested in

improving economic statistics. This report should serve as a most helpful basis for further discussion within the statistical agencies in planning for the improvement of wealth estimates. We believe the report also contains much that will be of value to scholars concerned with these problems.

During the 15 months devoted to the Wealth Inventory Planning Study, the Advisory Committee has met as a group four times. We have advised with the staff on its general plan of operation, and on the major conceptual, statistical, and procedural problems that are involved in improving and expanding national wealth estimates by industry, and national balance sheets by sector.

We wish to congratulate the project staff, particularly its director, John W. Kendrick, and the senior staff members, David J. Hyams and Joel Popkin. Theirs was a yeoman's task, and this full and constructive report bears witness to the high order of their imagination and professional competence. The still more detailed working group reports form an invaluable reference source. They reflect the good will and hard work of some 150 experts. They are also a tribute to the administrative ability and the strong powers of persuasion of the project staff. All users of national accounts now and in the future owe the project staff and the working group panelists a large debt of gratitude. Appreciation is also due The George Washington University for sponsoring the project and for releasing Professor Kendrick to direct it. The project owes a particular debt to President Thomas H. Carroll, who maintained an active interest throughout. And, without the financial backing of the Ford Foundation, the project would not have been possible.

In conclusion, the Advisory Committee again urges that within the Federal statistical establishment a prompt start be made on plans to expand the collection of wealth data and to provide more comprehensive and detailed wealth statements and balance sheets to complement the existing national economic accounts. We recognize fully that not all the conceptual and statistical problems have been solved, and that the wealth estimates which eventually emerge obviously will not be perfect. But if we had waited for complete answers to all questions, we still would not have the U.S. national income and product accounts. These have proved to be an indispensable tool for economic analysis and decisionmaking. Yet the original income and product estimates were constructed from data drawn from many sources and collected for other purposes. In many areas they were fragmentary and uncertain. Improvements in data, estimating techniques, and presentation have come with time and experience, and further improvements are continually underway. Systematic planning for collection of data to serve as the basis for wealth estimates will give Government statisticians one advantage over the early national income estimators. We stress that a long period of development lies ahead before the requirements for all potential uses can be met. But once the data base has been created, and continuing wealth estimates become part of the economic accounts, we are con-

vinced that they can and will be steadily improved to provide the empirical basis for a major advance in economic understanding.

RAYMOND T. BOWMAN,  
Bureau of the Budget

DANIEL H. BRILL,  
Board of Governors of the Federal Reserve System

DANIEL CREAMER,  
(Chairman), National Industrial Conference Board

EDWARD F. DENISON,  
Brookings Institution

A. ROSS ECKLER,  
Bureau of the Census

JOSEPH L. FISHER,  
Resources for the Future, Inc.

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Yale University

DOUGLAS GREENWALD,  
McGraw-Hill Publishing Co.

RICHARD H. HOLTON,  
Department of Commerce

GEORGE JASZI,  
Office of Business Economics

JOHN W. KENDRICK,  
The George Washington University

JAMES W. KNOWLES,  
Joint Economic Committee, U.S. Congress

NATHAN M. KOFFSKY,  
Department of Agriculture

WILLIAM H. SHAW,  
E. I. du Pont de Nemours & Co.

## PREFACE

The Wealth Inventory Planning Study was established by The George Washington University in February 1963, under a grant from the Ford Foundation. Briefly stated, its purpose has been to explore the problems and possibilities of a meaningful national inventory of wealth, and to develop guidelines for the collection of the requisite data and preparation of finished estimates.

This preface is intended to describe briefly the background, genesis, and organization of the study and to acknowledge the assistance of the many persons who have contributed to the report. It is preceded by a foreword written by the project Advisory Committee containing its general recommendations. The preface is followed by the summary report by the staff, and the appendixes, which comprise the basic background papers and the sector reports with recommendations of the various working groups set up to study the problems and possibilities of wealth estimates in each of the major sectors of the U.S. economy.

While this report is the final product of the Wealth Inventory Planning Study, it is only the first step toward a national inventory of wealth. It may take the better part of a decade before the inventory is completed—if it is tied into the existing Federal statistical system, as contemplated. When completed, it is intended that the inventory will make possible comprehensive and reasonably accurate continuing balance sheet and wealth estimates as an integral part of our national economic accounts.

### BACKGROUND AND GENESIS OF THE STUDY

Ever since the beginnings of economics as an organized discipline, economists have recognized the importance of the wealth as well as the income of nations as an analytical concept, and have made sporadic attempts to estimate its magnitude. In the development of official statistics, however, the estimation of national income and product has taken precedence. Begun in 1932, U.S. national income estimates were expanded in 1942 to comprise national product, and in 1947 an integrated system of accounts was developed. A few other countries had continuing official estimates of national income prior to World War II, but afterward the number grew rapidly, and at the present time over 80 countries provide national income and product estimates to the Statistical Office of the United Nations.

Continuing balance sheet and wealth estimates have been much slower to develop than the income and product estimates. The United States had a census of wealth approximately every decade from 1850 to 1922, but it was on a quite aggregative basis with unknown completeness of coverage, and with considerable ambiguity of valuation. After

it was dropped, individual investigators occasionally attempted estimates of national wealth based on available fragmentary data. In the late 1950's, in connection with its flow of funds estimates, the Federal Reserve Board began to publish partial balance sheets, by sector. But the data base was not strong enough to support comprehensive wealth estimates.

In 1955, Japan instituted a quinquennial wealth survey. In 1959, the Soviet Union began a detailed inventory of its tangible assets in both physical and value terms. Investigators in a number of other countries have made occasional wealth estimates, but like those in the United States, they have been based on partial data.

One reason for the prior development of regular national income and product estimates has been the availability of more or less adequate data, generally as a byproduct of Census, Internal Revenue, Social Security, and other statistical programs. Equally important, macroeconomic demand theory developed by J. M. Keynes and his early followers in the 1930's placed chief emphasis on current flows of income and expenditure. Keynes' conceptual development of the income and product framework gave a strong impetus to its statistical implementation to provide the tools for testing and refining theory, and for policy formulation.

While there has not been an equally influential single body of theory centered around asset or wealth variables, economic analysts have been accorded an increased emphasis to the role of stocks. On the supply side, there has been renewed interest in and further development of the production function concept, and the role of capital in economic growth and development. On the demand side, there is increasing recognition of the importance of the size and composition of real wealth and of financial assets, and the influence on demand of attempts to adjust asset ratios to desired positions. In the report and in appendix I, part A, there is detailed discussion of actual and potential uses of wealth and balance sheet estimates in analysis, projections, and policy determination.

#### GENESIS

The growing importance of stocks in economic theory, and the potential usefulness of wealth estimates and balance sheets as integral parts of the national economic accounts, were reflected in the 1957 report of the National Accounts Review Committee. This Committee of experts was set up in late 1956 by the National Bureau of Economic Research, at the request of the Office of Statistical Standards of the Bureau of the Budget, to review the major questions in the field of national economic accounting and to prepare recommendations for improvements of the accounts as effective tools for economic analysis. The relevant portion of the Committee's report follows:

The committee feels that as a part of a long-range program of improvement and expansion of our system of national accounts the development of comprehensive and consistent national and sectoral balance sheets on a regular periodic (if possible annual) basis should be taken in hand as soon as feasible.

The committee, however, recognizes that there are still so many unresolved conceptual problems in this field and that the estimates are in many cases necessarily still so rough that the next step should not be the immediate attempt by a Government agency to develop balance sheets or even national wealth statements. It seems to the committee that this is the field for a thorough study, exploratory and experimental in part, possibly by one of our private research in-

stitutions. Such a study would probably require an intensive effort over several years. It might be expected to result in, first, the development of superior methods of estimation and in improved actual estimates for many types of assets and liabilities; and, secondly, in a concrete plan for the collection of data in fields where only a Government agency is likely to secure the necessary information. After such a preparatory study the time will probably have arrived for one of the statistical agencies of the Federal Government to take over the preparation of periodic national and sectoral balance sheets as a regular feature, integrated, of course, with other parts of the national accounts.<sup>1</sup>

Although a number of the recommendations of the National Accounts Review Committee were carried out in the next several years, little progress was made toward planning for wealth and balance sheet estimates. In 1961, the Census Advisory Committee of the American Economic Association renewed the appeal for a study to determine the feasibility and content of a wealth inventory.<sup>2</sup>

In the spring of 1962, the present staff director, John W. Kendrick, together with Raymond Goldsmith, Daniel Creamer, and Edward Denison, drafted a project proposal for an exploratory and planning study for a possible wealth inventory. The advantages of a Washington location were apparent, and the initiating group received encouraging support, and sponsorship, from Thomas H. Carroll, president of The George Washington University. The proposal was submitted to the Ford Foundation in the summer of 1962.

The project proposal pointed to the need for, and potential uses of, a wealth inventory, but noted the difficult conceptual and statistical problems which made an exploratory study necessary. The desirability of a nongovernmental project located in Washington was stressed in the following words:

The exploratory nature of the enterprise is the main reason for recommending a study independent and outside of the Federal Government, but conducted in close contact and in cooperation with the relevant Federal agencies. It is the sort of preliminary work for which Congress is unlikely to appropriate funds, and other interested Government agencies do not have available "free funds" to divert to this research and planning task.

Because of the need for liaison between the project committee members and staff and Federal agency representatives, it seems appropriate that an organization with headquarters in Washington such as The George Washington University sponsor the preparatory study. The university department of economics will be represented on the project committee.

The responsibility for the exploratory study and the formulation of a practical plan for the conduct of the inventory will be centered in a small, full-time, and highly competent secretariat under the active guidance of the project committee of leading experts in the field of national wealth. The organizational plans also call for the use of a few subcommittees for particularly difficult or specialized sectors of the economy.

## ORGANIZATION OF THE STUDY

The director of the research staff of the study took office in February 1963. The first 2 months were devoted to reviewing available wealth data estimates, planning procedures for the study, choosing an Advisory Committee, and selecting the two staff associates and administrative secretary provided for by the terms of the grant.

<sup>1</sup> "The National Economic Accounts of the United States," pp. 256-257.

<sup>2</sup> The members of this Committee when the recommendations were made were: Solomon Fabricant, Director of Research of NBER, Chairman; Morris A. Adelman; Prof. Harold Barger; Edward F. Denison; Prof. Millard Hastay; Prof. Carl Kaysen; Prof. H. Gregg Lewis; Prof. John Lintner; Prof. Anthony Tang; Arthur M. Okun.

The Advisory Committee was set up for the purpose of reviewing the staff work, providing guidance as needed, and preparing recommendations of its own based on the staff report. At the suggestion of Ford Foundation officials, approximately half of the Advisory Committee was composed of representatives of the Federal statistical agencies which would presumably be most heavily involved in a wealth inventory; the other members were chosen from experts in the wealth field with academic and research backgrounds.

At its initial meeting on April 8, 1963, the Advisory Committee approved the staff director's plan of action, as described below. It also decided that, while the members would review the staff report and offer suggestions, the Committee should not assume responsibility for the report. The views of the Advisory Committee were to be reflected in its statement contained in the foreword. The project was planned to last approximately 1 year, and a final meeting of the Advisory Committee, at which its recommendations were hammered out, was held on April 24, 1964. At the initial meeting, and the two subsequent meetings on October 28, 1963, and January 3, 1964, the Committee discussed most of the major issues involved in the study.

In accordance with the staff plan, 14 sector working groups were formed, composed of experts in the various fields, drawn from universities, industry, and government agencies. The working groups were charged with the following responsibilities, which are reflected in the contents of their reports: (1) definition of the sector and consideration of actual and potential uses of wealth estimates for the sector; (2) review of existing wealth data and estimates for the sector; (3) evaluation of the data, and identification of the gaps; (4) recommendations for strengthening and expanding the basic data and for preparation of finished estimates.

A degree of direction and coordination of the activities of the working groups was achieved in several ways. Two sets of "guidelines" and several background papers on key issues were prepared by the staff for circulation to group members. Each staff associate served as working secretary to three groups, and as a member of four others; the staff director attended one or more meetings of each of the groups. In December 1963, there was a meeting of group secretaries for discussion of common problems and jurisdictional matters. Most of the sector reports, in at least preliminary form, were completed by February 1964.

Background materials were assembled by group secretaries, and the writing of the reports was their responsibility. Each secretary attempted to express the consensus of his group as faithfully as possible, and also to reflect possible minority views. Any member of a group was free to append a statement clarifying or elaborating his views, if he felt these had not been adequately represented in the final report.

The sector reports, which comprise appendix II, A to O, are an important part of the total Wealth Study report. Although they are summarized in the staff report, the reader must go to the sector statements for detailed discussion and recommendations.

The 10 background papers and commentaries which comprise appendix I, A to K, are also an important part of the study. Statements of the actual and potential uses of wealth estimates by economists from major organizations compose appendix I, part A.

It was also considered important to review the U.S. experience, and that of other countries, in conducting wealth inventories and preparing estimates, in order to see what might be learned to the benefit of future efforts (app. I, B to E). Appendix I, part F contains an explanation of the accounting framework for national and sector balance sheet and wealth estimates, and their interrelationships with the income and product accounts. The possibilities of obtaining capacity output data in conjunction with asset data, which would enhance the usefulness of a wealth inventory, are discussed in appendix I, part G. Various aspects of the difficult conceptual and statistical problems involved in valuation of assets are discussed in appendix I, H to K. The papers on valuation and on capacity served as the basis for two lively symposia held at the Wealth Study's conference room in November and December 1963.

Drawing on the sector reports and background papers, the staff wrote its summary report during the first quarter of 1964. In essence, the staff report attempts to (1) deal with the major conceptual and statistical problems of a wealth inventory as they cut across sector and industry lines based on the background papers, other materials, and discussions by the staff with members of the Advisory Committee, working groups, and others; (2) summarize the available wealth data and estimates and required extensions to provide a comprehensive national stocktaking, based on the sector reports; (3) provide guidelines for wealth data collection and the subsequent process of estimation within a national accounting framework.

The Advisory Committee foreword contains the general recommendations that emerged from committee discussions, backed up by the staff report and the other materials developed by the staff during the course of the study. The recommendations express the consensus of the committee, but individual members were free to prepare supplemental statements on issues about which they were not in substantial accord. None chose to do so.

It is hoped that the present report, in its delineation and suggested solutions of major problems, offers a sufficiently clear plan for further steps that it may effectively spark the eventual attainment of the basic objectives. Each year our economy becomes more complex, and continued expansion of our economic intelligence is essential if economists are to be able to do the necessary analytical work as background for sound policy formation. We would be shirking our obligation to the future if we did not now seek to lay the groundwork for national and sector stock estimates to accompany the national income and product statistics. Just as the flow data now seem indispensable, so will wealth estimates and balance sheets once they are available and have become a part of the analytical toolkit that has made economics an effective instrument of policy.

#### ACKNOWLEDGMENTS

The Wealth Inventory Planning Study would not have been possible without the generous grant provided by the Ford Foundation. In addition, during consideration of the proposal, helpful suggestions were made by Drs. Victor Fuchs and Henry Villard, then with the foundation.



The moving spirit behind the project proposal was Prof. Raymond Goldsmith, of Yale University. Although he has succeeded in preparing useful sectoral balance sheets and wealth estimates for the United States for selected years, he has been the first to stress the need for better and more extensive basic data to make possible more reliable and detailed estimates. He has also advocated eventual regular official estimates of sectoral and national balance sheets. Professor Goldsmith succeeded in interesting the present staff director in the project, and he provided moral support in the early days before a staff was assembled, as well as later. Dr. Raymond Bowman, Assistant Director for Statistical Standards, Bureau of the Budget, and Dr. Milton Moss of the same Office who was Dr. Bowman's chief liaison man with the Wealth Study, also provided early support.

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The role of the Advisory Committee has been vital. The several meetings during which they provided a sounding board and furnished specific advice to the staff have been noted above. The wisdom of their recommendations is plain for all to see in the foreword. The membership of the Advisory Committee is given there, but special mention should be made of Daniel Creamer, who served as chairman and took an especial interest in following the month-to-month work of the study, and Edward Denison, who prepared the initial draft of the foreword. Each member of the committee reviewed intensively at least one appendix and one major section of the report, as well as reading the report generally. This not only served as background for formulation of recommendations but also resulted in constructive suggestions to staff members. While not a member of the Advisory Committee, Murray Dessel of the Census Bureau also read the entire report and suggested many worthwhile revisions.

Special thanks are also due to the more than 150 persons who served as members of the sector working groups or who prepared background papers for the study. All participants are named at the beginning of the various appendixes. Each of the working groups met at least two or three times, and in addition all members of each group reviewed their report at various stages of preparation and many offered suggestions. Especial gratitude is due to the working secretaries, eight of whom came from outside the staff, who prepared materials and wrote their groups' reports. Some groups also had chairmen, on whom additional responsibility fell. The authors of the background papers have all made significant contributions, and in some cases had to defend their papers at discussion sessions organized by the staff. The outside secretaries and authors of background papers are listed on the title page of the report as consultants.

In view of the large number of people who participated in the Wealth Study, perhaps it is not unreasonable to claim that one of its contributions has been to involve these people, some of whom may well participate in later stages of the development of wealth data and estimates, in thinking about the conceptual and statistical problems

posed. For all the time and thought they gave, we are grateful. We are also grateful to the Government agencies, private companies, universities, and other institutions who felt the study was important enough that they were willing to release the time of the participants and, in many cases, to cover their travel expenses.

Now I come to my staff; without their dedication to our common task, the study could not have been completed in such a relatively short time. David Hyams and Joel Popkin each prepared three sector reports, performed liaison with four other sector working groups, and together summarized most of the group reports in chapters 9, 10, and 11. Mr. Popkin also helped the director prepare parts of several other chapters. The intelligence and industry with which both performed their assignments were an important element in the final product of the study.

Courtney Knauth and Barbara-Ann Hoyler served ably as administrative secretaries of the study, from March through July 1963, and from August 1963 to June 1964, respectively. Mrs. Knauth was helpful in getting the rather complex organization of the study into operation. Mrs. Hoyler effectively performed the administrative and secretarial work in carrying it forward and getting out the completed report. Just as important, both contributed greatly to a happy working environment at the Wealth Study offices. Paulette Brombart, Judith Nevins, and Paula Metzl, served ably as typists for the report.

Finally, we are grateful to all those who are interested in this report and its implementation. Certainly, the expansion and improvement of economic statistics are prerequisite to improvement in the quality of economic analysis and decisionmaking. It is our belief that the most important single field in which improvements are needed is wealth.

JOHN W. KENDRICK,  
*Staff Director.*

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(JOHN W. KENDRICK, DAVID J. HYAMS, and JOEL POPKIN)

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THE STAFF REPORT

JOHN W. KENDRICK  
DAVID J. HYAMS  
JOEL POPKIN

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## CHAPTER 1

### SUMMARY OF THE STAFF REPORT

The general objective of the Wealth Inventory Planning Study has been to analyze the problems and possibilities of a comprehensive inventory of national wealth, and to prepare guidelines for the collection of needed data and the estimation of wealth by significant categories. The major problems of a wealth inventory with which the staff has been concerned, and its tentative findings, will be previewed in this summary chapter.

The main purpose of the staff report has been to provide a consistent conceptual framework and general statistical guidelines for the subsequent detailed work of designing asset schedules for the various sectors. As stressed by the Advisory Committee in its foreword, it will be more practical, efficient, and economical to incorporate the wealth schedules into the existing reporting programs than to attempt a comprehensive one-time survey or census of wealth. This suggested approach will require coordination within our decentralized Federal statistical system, and the guidelines developed here should be of substantial help in that task.

The final chapter of the report contains a recapitulation of the general guidelines, and recommendations regarding the reporting vehicles which would be appropriate for collection of the required wealth data from the various sectors and industry groups of the economy. The summaries in this chapter are purposely brief, and do not contain the detailed reasoning behind the conclusions reached, nor the qualifications which must often be attached to them. The specialist or technician will wish to consult the rest of the report, and its appendixes, for full discussions of the many issues involved. We have not attempted to summarize the specific recommendation made by the various sector working groups, including recommendations for pilot studies and feasibility tests in certain sectors, which are contained in appendix II, parts A through O.

#### SCOPE OF A WEALTH INVENTORY (CHAPTER 2)

Broadly defined, the wealth of a nation consists of all resources which contribute to the production of goods and services that men want. As a practical matter, the Wealth Study has confined itself to nonhuman, tangible resources, and financial claims. The major types of tangible wealth are land and other natural resources, buildings and other structures, machinery and equipment, inventories, and manmade nonreproducible goods. They have been considered in terms of major sectors of ownership and/or use: Households, business (by industry groups), private nonprofit institutions, and governments. Regardless of type of asset or sector of ownership, the distinguishing characteristic

of all wealth and the source of its value, is its capacity to contribute directly or indirectly to the production of goods and services, and thus to income, over future periods.

### USES OF WEALTH ESTIMATES (CHAPTER 2)

Many important analytical uses can be envisioned for reasonably comprehensive and detailed national estimates of tangible wealth, by industry, and of complete balance sheets, by sector. Such estimates do not now exist on a continuing basis, although considerable use has already been made of occasional sets of estimates made for past periods, and of partial estimates currently available.

In economic analysis, the chief uses are for studies of demand, and of supply capabilities. Economists are placing increased importance on holdings of assets, both real and financial, as an element influencing the demand for final products by both consumers and producers. Productive potentials obviously depend on the quantity and quality of tangible resources. The changing relationship between output and real capital stocks is an important aspect of the study of changes in productive efficiency, or productivity, in the various industries of the economy.

Many other more specific uses are detailed in chapter 2, and some of these are highlighted in the Advisory Committee's statement. Certainly, study of past trends and relationships is a prerequisite for projections into the future on alternative assumptions, and thus for the formulation of policies designed to achieve the economic objectives of the community. Many economists feel that improvement of tangible wealth or stock estimates as an extension of the continuing national income accounts is the single most important step that needs to be taken to deepen their understanding of the functioning of the economy.

### EXPERIENCE WITH WEALTH INVENTORIES AND ESTIMATES (CHAPTER 3)

Eight so-called censuses of wealth were taken in the United States from 1850 through 1922. The early censuses were largely based on the assessed values of all taxable real and personal property, blown up by estimated ratios of market to assessed values. The resulting estimates for taxable real estate were relatively reliable, but the personal property estimates were ambiguous as to coverage and little detail could be presented nationally by type of property. The later censuses, and some private studies in the 1930's, supplemented the assessment data by book value data from industry censuses and other sources. Unfortunately, valuations were not consistent, detail was still limited, and the estimates suffered from the lack of a social accounting framework to provide a more meaningful structuring of the estimates.

After World War II, several academic economists, notably Profs. Simon Kuznets and Raymond Goldsmith, prepared estimates of national wealth, in current and constant dollars, going back to the 19th century. The perpetual inventory method was introduced, which involves the cumulation of real net investment estimates, and their deflation to current prices. The same method is used by the Office of Business Economics for estimates of fixed reproducibles in a few major sectors. Because of possible progressive biases in cumulated net in-

vestment, the need for a comprehensive and reasonably detailed basic inventory of tangible wealth as a benchmark for the wealth estimates is recognized by all who have worked in this field.

Professor Goldsmith has also published two studies which provide balance sheets, by major sectors and types of financial assets and liabilities, through 1958. The Federal Reserve Board publishes partial balance sheets on a current basis. These, too, would benefit from improved basic data.

### WEALTH INVENTORIES ABROAD (CHAPTER 3)

Wealth estimates on a one-time or occasional basis, similar to those available for the United States, have been made in a number of other countries. Two countries, the Soviet Union and Japan, have conducted a wealth census and survey, respectively, that merit study as background for expanded wealth data collections here. The Soviet census covered all fixed reproducible assets in great detail, since its purpose was to provide consistent valuations and to improve balance sheets and cost accounts of establishments, as well as to provide a better statistical basis for national economic planning by industry and enterprise. Such a detailed census would not seem necessary in a predominantly market-oriented economy, where the wealth estimates would be used in analyses as background for decentralized decision-making.

More can be learned from the Japanese wealth survey of 1955 (later extended to 1960). Important features of the Japanese survey were the use of an national accounts framework; sampling, by sector; considerable type of asset detail; and consistent application of current valuations. Capital goods price data were inadequate, however, for reliable revaluations.

### THE DESIGN OF WEALTH INVENTORIES AND ESTIMATES (CHAPTER 4)

There is no question but what wealth estimates are of greater value when they are tied into the national income and product accounts to facilitate analysis of economic interrelationships. Thus, the design of the accounts with respect to sectors or industries and types of assets, affects the structure of wealth estimates and the design of the underlying collections of data.

Estimates of tangible wealth, by industry, should be distinguished from estimates of total assets as part of sector and national balance sheets, although both tie into the basic income and product accounts. Tangible wealth estimates, by industry, are primarily useful for analysis of the production function, and of productivity. For these purposes, data should be collected from establishments (as distinguished from companies, in the case of multiestablishment firms). The "Standard Industrial Classification Manual" furnishes the appropriate framework for industry classifications of establishments, since it is followed both by the data-collecting agencies and by the Office of Business Economics (with a few adjustments) in preparation of estimates of national income and product, by industry, and of inter-industry relationship tables. Because of their increasing importance, leased capital goods should be allocated to the industries of use, although basic data would have to be collected by industry of ownership.

In addition to the capital asset values, it would be useful to collect physical-unit data for those important asset classes which are composed of homogeneous units. If adequate questionnaires can be designed, it would also enhance the usefulness of asset-value data to collect respondent estimates of the associated capacity output (see app. I, pt. G).

With respect to types of tangible assets, data should be collected and estimates presented for at least major types, consistent with the new investment categories used in the gross national product estimates. But for small subsamples of firms, much greater detail should be obtained, not only for its intrinsic interest, but also (in conjunction with age data) as a basis for revaluation of book values, discussed below.

Much wealth data is now available on a county basis. Preparation of estimates at least by States and major standard metropolitan areas for the benchmark year seems feasible, and desirable for purposes of regional analysis.

#### THE DESIGN OF NATIONAL BALANCE SHEETS (CHAPTER 5)

Balance sheets for the various decisionmaking sectors of the economy are useful for financial analysis. These can be combined into a national balance sheet, or consolidated to show national net worth, consisting of tangible assets and net foreign claims. The Federal Reserve Board partial sector balance sheets show financial assets and liabilities, but not the value of tangibles and net worth. This underscores the need for expanding the collection of data on tangible assets. The tie-in between sector flow of funds (changes in financial assets and liabilities), balance sheets, and the national income accounts lies in deconsolidation for the same sectors of the saving-investment account. The difference between sector saving and tangible investment is net financial investment, as explained in chapter 5 and appendix I, part F. The FRB estimates and the OBE national income accounts have not yet been coordinated along these lines, however.

With regard to the FRB sectoring, there is need for better data to make possible more homogeneous and detailed sector estimates. For example, adequate data would permit personal trust funds and private nonprofit organizations to be shifted out of the household sector. Perhaps the most useful additional detail would be provided by breaking down the nonfinancial business sector into broad industry groups to permit analysis of differences among industries in financial structure and behavior. In this context, industries are composed of entire companies. A useful link between Internal Revenue Service company data and census establishment data has been provided by the Census Bureau as part of the 1958 enterprise statistics program.

Somewhat more detailed data on types of financial assets and liabilities would also be desirable. The additional data would most expediently be obtained for the inventory year by additions to existing IRS tax forms. Separate reporting of foreign claims on the forms is required for the rest-of-world account.

#### VALUATION—GENERAL APPROACHES (CHAPTER 6)

Asset data must be collected from firms and other organizations in terms of book values, which generally reflect original or acquisition cost. Because of changes in prices and changes or differences in de-



preciation practices, book value data are not comparable among industries. It is generally agreed that market values or approximations thereto are more meaningful for economic analysis, since market values reflect the present value of the expected net income from the use of the assets, which in the case of new reproducibles, equals production costs plus markups of sellers.

Markets for many secondhand durables are not extensive enough, however, to permit the respondent to give a fair estimate of current value along with data on book values. Consequently, the estimating agency is confronted with the problem of using book-value data together with relevant collateral data in order to estimate market values, or approximations of market. The same valuation principle is used in the national income and product accounts.

If direct estimates of market are not feasible, estimates may be attempted from the demand and supply sides alone. By the former approach, the expected future net income from the use of the asset may be projected, and discounted to the present. By the supply approach, gross and net (depreciated) replacement cost can be estimated in the case of fixed reproducible goods (see below). If appropriate price indexes and depreciation curves can be obtained, then depreciated replacement cost will be a good proxy for market price. Other approaches are discussed in chapter 6 and in some cases, current values can and should be estimated by more than one approach.

#### VALUATION—MAJOR CLASSES OF ASSETS (CHAPTER 7)

Every effort should be made to extend as far as practicable the collection of estimates of market values by owners or appraisers or the application by the collection agency of market prices or unit values, where available, to physical-unit data. For much of the fixed reproducibles, however, gross and (depreciated) replacement cost will have to be estimated by the statistical agency. This requires, in the first instance, basic data on acquisition cost by type of asset by year or period of acquisition as noted above. Capital goods price indexes would also need to be supplemented to some extent, and more studies made of the service lives and depreciation patterns of durable goods.

Requirements are much less burdensome for improving estimates of inventories at market prices. In the farm sector there are already virtually complete data on physical units and prices of crop and live-stock inventories. The reflation of book values by OBE could be improved by obtaining more information for the benchmark year as to types of inventories and inventory accounting methods of respondents in nonfarm industries.

Manmade nonreproducible goods, such as paintings and other art objects, are an interesting special case. Markets for these and most other collectors' items are generally active enough that owners or appraisers could produce fair estimates of market values, although further exploration of problems and possibilities in this field are needed. The category does not command high priority in a national wealth inventory, however.

Natural resources also pose special problems as nonreproducible assets, and their value is great enough to justify considerable effort to collect adequate data. Owner estimates, valuations by appraisal

boards for certain types of public resources, and the discounting of projected net income, are all avenues that have been used and could be expanded. Annual price indexes are badly needed for nonfarmland and other natural resources with active markets, such as oil reserves, in order to extrapolate the estimates from the inventory year. Better physical volume data would be useful.

With respect to financial claims, markets exist for many types of instruments. In the case of short-term claims, where they do not, book values are generally good approximations to market values. For longer term nonmarketable claims, market value estimates could be constructed by methods outlined in chapter 7 and appendix II, part O.

### THE FEDERAL STATISTICAL SYSTEM (CHAPTER 8)

Since the Federal Government has traditionally performed the function of collecting data and preparing estimates of general interest, expansion of work in the field of wealth data and estimates would fall largely on the Federal statistical agencies. A review of the Federal statistical system in chapter 8 indicates several practical features that must be built into a possible wealth inventory, and sets the stage for a review of wealth data availabilities and requirements by sector.

The Federal statistical system is decentralized. There are "general purpose" statistical agencies which collect, compile, and publish statistics in various fields for general use; there are administrative and regulatory agencies that collect data mainly as a byproduct of their primary responsibilities; and there are analytic and research agencies that prepare composite estimates and analyses using statistics collected by the first two types of agencies. The Office of Statistical Standards in the Budget Bureau provides coordination and leadership in working toward an integrated and adequate system of Government statistics.

Some of the reporting programs are on an annual basis. But the key Census Bureau economic census programs are on a 5-year cycle, while the population and housing censuses are taken decennially. A few areas of the economy are not now covered by any systematic reporting program. The existing reports differ widely with respect to the amount of wealth data collected.

Three conclusions may be drawn from the review of the Federal statistical system: (1) It will be more practical to graft additional questions on wealth onto the existing reporting systems for the various economic sectors than to conduct a comprehensive one-time survey; (2) this approach will necessitate the active leadership of the Office of Statistical Standards, possibly through an interagency wealth committee, in starting the necessary preparatory work and carrying forward the work of this study in providing guidelines for the various participating agencies in order to achieve consistency of method and result; (3) the active cooperation of the wealth-estimating agencies, primarily the OBE and FRB, will be needed in refining the guidelines, and advising with the Office of Statistical Standards and the data-collection agencies as to data required for reasonably accurate wealth estimates, within a national economic accounting framework.

## REVIEW AND EVALUATION OF WEALTH DATA (CHAPTERS 9, 10, 11)

Here we recapitulate the summaries of the sector group reports, which comprise chapters 9, 10, and 11, within the framework of an appraisal of the relative adequacy of wealth data for the various sectors.

## FINANCIAL CLAIMS

In general, data on financial assets and liabilities are more comprehensive in coverage than data on tangible wealth. This statement is predicated on the assumption that surveys of financial characteristics of families such as that conducted by the Federal Reserve Board in 1963, will continue to be made periodically for the household sector (which holds almost half of total financial assets). In fact, it is to be hoped that for the inventory year the sample can be expanded significantly, using the 1970 decennial census records as a universe for the selection of the sample housing units.

Adequate data are generally available for the public sector, on a recurring basis, from the Treasury Bulletin and the Census of Governments. Only four major classes of assets are shown for State and local units in the latter source, however, and somewhat greater detail would be required in the inventory year.

In the business sector, the chief source of information is the Internal Revenue Service which tabulates balance sheets from income tax returns of corporations and partnerships at the three-digit SIC level, and publishes summaries for two-digit industries. Since less than half the partnerships file balance sheets with IRS, the regulations requiring all partnerships to file balance sheets should be enforced for the inventory year, as well as requiring somewhat more detail from all firms.

No balance sheet data are collected for sole proprietorships. This means that financial claims data are relatively least adequate in those sectors in which proprietorships predominate, such as agriculture, real estate, and services. It is suggested that the required data be obtained through the household survey.

Portions of the nonprofit institutions sector are not covered with respect to both tangible and financial assets. Some of these can be covered by enforcing, for the inventory year, the requirements that they report balance sheets to IRS. Others could be covered by expansion of census or private association programs.

In addition to financial items, IRS balance sheets also contain data for tangible assets—land, depreciable, and depletable assets, and inventories. But since balance sheets perforce relate to industries-of-companies, they cannot be looked to as sources of data for tangibles for use in production function analysis except, perhaps, in those several industries in which single-establishment firms predominate. Given the existence of establishment as well as company surveys, periodic work along the lines of the IRS-Census link project would make it possible to use the more detailed establishment data for analysis, revaluation and possible allocations of the company data.

## TANGIBLE ASSETS

There are some major gaps and deficiencies in tangible asset data for all major sectors. Stated briefly with respect to coverage, data are extensive for the Federal Government (except for personal property) but seriously lacking for State and local governments. In the household sector, data are obtained for houses and some major durables, but are largely lacking for other types of goods. Some major classes of private nonprofit institutions are not covered. In the business sector, coverage is good for some industry groups such as the regulated or supervised industries, agriculture, and manufacturing; for other industry groups, coverage is largely lacking, as for construction, mining, real estate, and parts of the service industries. For a few industries, there is not even an existing reporting program into which asset schedules could be tied. For example, the Census Bureau has not covered construction and some major categories of the service industries since the 1930's, and resumption of surveys is indicated.

Even in the industries for which reporting coverage is good, there is much variation with respect to the degree of detail in which the asset data are obtained. Several dozen property accounts (by type) are maintained for the regulated industries; some detail is gotten for major types of real property and equipment in agriculture, and extensive detail is available on farm inventories. For the enterprises in minerals, manufacturing, trade and service industries covered by the Census enterprise statistics, the book values of tangible assets are obtained only for the several major categories. Clearly, considerable asset detail will have to be obtained for all industries, not only for its intrinsic interest but also for revaluation purposes. In this connection, it must be emphasized that in almost all cases, data on the age-distribution of assets, by types, will have to be obtained in the inventory year at least for small samples of establishments in the industry detail recommended.

The agencies and reporting programs which appear to be logical vehicles for the wealth inventories are detailed in the final section of the guidelines set forth in chapter 12, and will not be repeated here. In general, expansion of the existing reporting programs and a few new programs are recommended.

## SUMMARY GUIDELINES (CHAPTER 12)

In addition to recommending specific reporting programs for the various sectors, chapter 12 contains a recapitulation of the general guidelines developed in the body of the staff report. Many of these have been implied in this summary, and the reader wishing to see them in systematic form may consult the concluding chapter. The formulation of the guidelines has been an important part of the Wealth Study. They will serve as a basis for the blueprinting of consistent wealth questionnaires and reporting instructions by the various Federal statistical agencies that will be involved if the wealth inventory becomes a reality. The guidelines, as refined by further discussion in the Government, will also be helpful to those agencies which will be responsible for the final wealth estimates.

## CHAPTER 2

### SCOPE AND USES OF A WEALTH INVENTORY

The wealth of a nation consists of all its productive resources—those aspects of the environment, natural and manmade, which contribute to the production of goods and services that men want. While thus productive of income, wealth itself is a fund, or a *stock*, as contrasted with the *flow* of income and product which results from its use. Production results from the *use* of wealth; the *using up* of wealth, or capital consumption, must be deducted from gross investment in order to calculate net changes in wealth, and it must also be deducted from gross income in order to estimate the net income accruing to owners of wealth.<sup>1</sup>

The chief common characteristic of all forms of wealth, its contribution to net income and product, is the source of its value. That is, capital assets are generally valued in terms of their expected future net income stream discounted to the present. The income may, of course, be of a direct psychic nature, as well as monetary. The valuation of wealth is discussed in detail in chapter 6, both theoretically and from the viewpoint of measurement. Here, it suffices to note that unless resources have value they are not included in estimates of wealth.

#### MAJOR PHYSICAL TYPES OF WEALTH

Wealth is composed of myriad types of tangible assets, human and nonhuman, embodying varying intangible characteristics, and the term is also used to cover financial claims. The underlying physical composition of wealth gradually changes, just as the drops of water in waterfall change, but the fund remains a source of productive power. Nevertheless, in the case of wealth, it is customary and useful to distinguish certain broad categories based on physical characteristics.

A basic distinction is that between human and nonhuman wealth. This distinction is fundamental in a free society in which labor services are bought and sold, but not the human beings themselves. In addition to the legal distinction between men and property, the inevitably man-centered interests of man dictate that human and nonhuman wealth, and the income flows accruing to each, be distinguished. Further, in the case of wealth, the purchase and sale of nonhuman assets in the market provides a means of valuation that is not accessible for human capital. Some economists have become interested in imputing a value to human wealth, or in valuing certain qualities of this wealth, such as the portion of human capital created by investments in education, training, and medical care, as well as the basic

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<sup>1</sup> See John W. Kendrick, "Some Theoretical Aspects of Capital Measurement," *American Economic Review*, vol. 51, No. 2, May 1961.

expense of rearing children to working age. Due to the experimental nature of this work, and the complexity of the problem, the staff and Advisory Committee of the Wealth Study decided at the outset to confine the study to the problems of estimating nonhuman wealth. This is not to deny the central importance of human capital, and we would encourage the collection of data which would facilitate further exploratory estimation work—such as data on incomes cross-classified by relevant characteristics, the investments involved in education, training, and medical care, as well as the basic expense of child rearing. But the estimation of the value of human wealth must still be regarded as experimental.

Even when the scope of a wealth inventory is limited to the more readily quantifiable nonhuman assets, it is still very broad—comprising both tangible productive assets and the “intangible” or financial assets. In the Nation as a whole, a part of the total assets is offset by liabilities, and the residual net worth comprises primarily tangible wealth consisting of productive natural resources, structures, equipment, and inventories, plus net claims on other countries.

The central focus of the Wealth Study is on the domestic tangibles, plus the net foreign claims adjustment, which comprise national wealth on a *consolidated* balance sheet. But, there is also interest in balance sheets of the various sectors, and a combined balance sheet for the Nation. Hence, we have also paid attention to the requirements for improving and expanding data on financial assets and liabilities. But since the financial data and estimates generally are in better shape and pose less difficult conceptual and data-collection problems, less time has been devoted to their study.

Within tangibles, a distinction is often made between manmade “reproducible” capital, and land and other natural resources. Yet considerable labor must be invested in the discovery and development of most natural resources, so that in a sense they also have a production, if not a reproduction, cost. Further, the value of natural resources, like that of all capital, is derived from their expected future net income stream; investments in natural resource development, like that in reproducibles, depends on the expected rate of return in relation to the cost of the required funds.

As the Natural Resources Working Group points out, however, it is generally difficult if not impossible to separate the value of the capital sunk in productive natural resources from the capitalization of the rents of the pure gifts of nature. Even the valuation of developed natural resources as a whole generally presents greater difficulties than the valuation of reproducibles since a cost approach is not practical. Nevertheless, because of the general interest in natural resources, we favor presenting estimates for this category separately while recognizing the basic similarities to purely manmade wealth, and the mixture of the two in resource valuations.

The reproducible tangibles comprise the broad categories of fixed depreciable assets—structures and equipment—and inventories. Some economists have questioned the inclusion of military assets in Federal Government and national wealth. We have included them in our review, and suggest that sector and national totals can be shown both inclusive and exclusive of military assets to suit different analytical purposes.

The questions of further desirable detail of the broad categories are discussed later in the report. But the common characteristic of all wealth must be held in mind—namely, that the value of all assets derives from the future income stream expected from their use.

#### SECTORS OF OWNERSHIP AND USE OF WEALTH

The Wealth Study staff has been interested in all nonhuman assets irrespective of sector of ownership or use. In a predominately free enterprise, market directed economy the bulk of productive tangible assets is owned by the private business sector. But much of publicly owned wealth contributes to the productivity of the private economy, or is used to furnish services directly to consumers. Likewise, consumer durables and household inventories furnish a stream of services directly to households—whether owned by individuals or leased from business. The wealth held by cooperatives and nonprofit institutions is likewise productive and should be included in any nationwide inventory.

After all, there has been a considerable relative shift in ownership of various types of capital as among the three major sectors, business, government, and households, in part due to the development of consumer durables, the proliferation of leasing arrangements, and the relative growth of governmental activities. One of the basic rules of economic accounting is that significant aggregates should be invariant to institutional changes. The basic criterion with respect to inclusion of items as wealth should be the broad one that they are productive of consumer satisfaction or utility, either directly or indirectly, or are expected to be in the foreseeable future. Identification of the sectors and industries of ownership and use is desirable, of course, in that this permits the analysis of changing patterns through time. The question as to the sectors and categories of wealth which it is significant to distinguish will be discussed further in the sections on design of the inventory in chapters 4 and 5.

#### USES OF WEALTH ESTIMATES, ACTUAL AND POTENTIAL

It has become a cliché in economic statistics that the intended uses of estimates condition their nature—the estimating methodology employed as well as underlying concepts and definitions. This is only partially true as regards the broad, summary estimates presented in varying degrees of detail which compose the national economic accounts.

By their very nature, the national economic accounts are designed to serve many uses and users. In this respect they are “general purpose” statistics. The requirements of different classes of users may be different, and even opposed, so that the accounts cannot serve all uses equally well. Further, all uses cannot be anticipated in advance. Various uses emerge once new estimates become available and familiar.

It is nevertheless true that a consideration of major potential uses is desirable in planning new sets of estimates such as national balance sheets and wealth estimates designed to complement the income and product accounts. These will influence choices of framework, concept, and method, although compromises will have to be made among uses and between the ideal and the statistically feasible.

It is particularly important that much detail be provided, so that users can rearrange series to fit their needs; that alternative series be present in some cases (as current, original, and constant values); and finally, that sources and methods be described in enough detail to allow users to determine for themselves the appropriateness of given series for their purposes.

#### GENERAL USES OF NATIONAL ECONOMIC ACCOUNTS

Summary economic statistics, in the first instance, are used in analyses that contribute to more precise knowledge of magnitudes and relationships, both at a point in time and through time. Understanding of the functioning of the economy, based on the statistics, can be used either directly as a basis for policy formulation, or in projections which, in turn, are used as a basis for formulating policies of either an adaptive or directive nature.

In direct use, the statistics may serve to reveal situations that require correction. Or, the relationships and models that developed from the statistics can be used to indicate the effects of alternative policies, and thus help in choosing among them. The chief users of macroeconomic estimates as background for the formulation of policies intended to influence the economy are governmental bodies, particularly the Federal Government agencies, including the Federal Reserve Board.

As national income and product accounts have improved, they have been used increasingly as a framework for short- and long-run macroeconomic projection, both by governmental agencies and by private companies and other organizations as background against which to project microeconomic variables. The projections have been used at both levels in planning policies to adapt to the anticipated changes. At the governmental level, in some instances the projections reveal developing situations requiring corrective policies.

It is within this context that we discuss uses of national balance sheet and wealth estimates by sector and industry, for varying degrees of regional detail. The estimates are useful in broadening economic intelligence, making possible deeper, and more accurate, economic analyses as a background for projections and policy formulations with particular regard to mitigation of economic fluctuation and promotion of growth.

#### LEVELS OF ANALYSIS

For each of the substantive analytical uses discussed below, the analysis can proceed on a number of levels. A one-time inventory makes possible cross-sectional comparisons—the composition of wealth by sector, by type of assets, by type of ownership, by size of establishments, by income and asset size of property owner. The relationship of structure to other factors can be explored. Assuming regional breakdown, and comparable inventories for other countries, inter-regional and international comparisons can be made for each of the variables noted above. Also, the composition of sector aggregates can be used by component organizations (households, firms, nonprofit institutions, or governmental units) as norms against which the individual unit's characteristics can be compared.



Successive wealth inventories (or annual estimates on a less-detailed basis) can be used to trace historical changes for given items, changes in composition for a given area, relationships between wealth and associated variables for the total economy and its sectors, and to make interspatial comparisons of changes in all these factors.

This summary description of possible levels of analysis suggests the richness of the potential increments to knowledge that would be made possible by systematic wealth estimates prepared consistently with the national income accounts. The accounting framework is essential to insure compatible estimates for the study of economic interrelationships.

#### MAJOR CATEGORIES OF ANALYTICAL USES

Concrete types of analyses made possible by wealth estimates are discussed below under six major headings. The first five relate to tangible wealth, the sixth primarily to financial items on national and sector balance sheets. The uses themselves suggest the sorts of detail that would be desirable in wealth estimates. Potential uses, and data requirements for their realization, are discussed by some major users of wealth estimates in appendix I, part A.

##### *1. Studies of economic aggregates and their structure*

Estimates of total wealth, by various meaningful classifications, permit analysis of changes in aggregates and structure through time, and cross-sectional and dynamic comparisons among nations and regions. Classification may relate to types of assets, sectors and industries of ownership and use, asset-size classes of establishments and firms within the producing sector, and asset-size classes of families in the household sector.

Differences in structure between countries at different stages of economic development can be compared, as well as changes in structure in the course of economic growth. This adds a dimension to the usual analysis in terms of income and product, since certain types of assets (as for households and governments) are not reflected in income flows, and the composition of assets differs from the composition of realized income for the various sectors.

Comparative and temporal analysis of aggregates and structure provide a background for long-range planning and projections, both in developed and underdeveloped countries. A wealth-size distribution of families usefully supplements income-size distributions in studies of consumer behavior. The wealth-size distribution of firms and establishments may aid in studies of efficiency (point 2).

To appraise relative national security potentials, current levels of economic output and capital stocks and rates of growth of various countries are important statistics. National wealth estimates also aid in the appraisal of the current potential for total and security output of the Nation in case of emergency.

The composition of national wealth, as well as of national product, adds a significant qualitative aspect to comparisons of national economic strength and welfare. For example, the comparative size and growth of stocks of capital allocated to production of military goods and to military research and development are important to determine.

## 2. *Productivity, or efficiency, studies*

Estimates of the relationship between real capital stocks and output in the total economy, by sector and industry, indicate levels and changes in the use of capital goods per unit of output. The capital coefficient (capital-output ratio) and its inverse capital productivity (output-capital ratio) can be calculated for as many types of capital as there are separate estimates.

Capital productivity ratios can be combined with ratios of output to the other resource inputs (labor and materials) in order to yield total productivity ratios; or production functions can be computed for different periods or points in time. Statistical production functions, or changes in total productivity, indicate the net saving of resource inputs, or real costs, per unit of output, and thus the increase in productive efficiency over time. If productivity is measured in terms of output per worker (or man-hour), then capital per worker measures help to explain changes in labor productivity.

In addition to economy and industry measures, individual companies and governmental agencies have been undertaking measures of their own productivity in recent years. They serve as management control tools and the calculation and publication of productivity estimates promote the development of efficiency mindedness. Causes of productivity change can be uncovered by relating output-capital and other productivity ratios to associated variables, such as intensity of research and development, industry structure, business fluctuations, profit rates, and scale of output. These analyses serve as background for policy measures designed to increase productivity at the organization or economy level.

Studies can be made of the effects of productivity change on economic aggregates and structure (through interrelationship with unit costs, prices, sales and output), which can serve as a basis for projections, and for the formulation of policies designed to deal with technological and economic changes as they affect people.

## 3. *General demand analysis*

Economists are beginning to place more emphasis on the process of adjustment in holdings of assets of various sectors toward desired norms. Thus, for the household sector, liquid assets and their relationship to income are believed to influence spending-saving decisions. Just as businessmen are clearly influenced by the actual and desired ratios of inventories to sales (the number of days supply) in their rates of ordering and purchase, so are they also influenced in investment decisions by the relation of actual to desired ratios of fixed capital to output.

Thus, the economic analyst, by watching sector stock-flow relations, is aided in projections, and in formulation of policies designed to stabilize the rate (or rate of growth) of expenditure.

## 4. *Analysis of capital goods markets*

The capital-output ratios furnish a useful background for analyses and longer-range projections which, in conjunction with output projections, make possible estimates of new capital requirements in the aggregate, by sector, and by broad classes of capital goods. Likewise, estimates of the value (or number of items) of capital goods, by age

group, in conjunction with length-of-life or mortality curve estimates, provide a basis for projecting replacement requirements.

Projections of capital goods purchases are useful from several points of view. Companies, nonprofit organizations, and governmental units need such projections as part of the budgeting procedure, which, in turn, is necessary for estimating required financing. Construction firms and capital goods manufacturers, on the selling end, are very much interested in projecting their probable markets over short and longer periods. From the overall economic viewpoint, projections of capital outlays are a key ingredient in general economic forecasts, necessary as a background for national policies to maintain high level demand, income, and employment.

##### 5. *Rate of return comparisons*

Estimated asset values, when divided into the corresponding property income, yield estimates of rate of return on capital. Levels and changes in rates of return in the whole business economy are relevant to total investment, income, and employment. Comparisons among industries are of interest, especially to the regulated industries. Differences in levels and rates can be related to associated factors, on the sides both of cause and effect. Among the latter, the relationship to rates of investment is particularly important. Individual company rates can be compared with average industry rates.

For interindustry comparisons, it is important that asset values consistently be converted to current values. This gives rise to the need of "depreciation valuation adjustments" to profits in order to eliminate the effects on profits of under or over depreciation due to price level inflation or deflation.

Rate-of-return analyses are useful background for business investment decisions, and have a bearing on public utility regulation. Overall rate-of-return trends and movements are central to income and employment policy formulation.

##### 6. *Financial analysis*

Various financial analyses illustrated in the list below are made possible by complete sector and national balance sheets.<sup>2</sup> These are useful both to the agencies responsible for framing fiscal and monetary policy, and as background for projections and policy formulation by managements of various types of financial institutions.

(a) *Composition of assets.*—The proportion of total assets the public chooses to hold as money, and the relation of the stock of money to total transactions and to income, are important for cycle analysis and monetary policy. So also are velocities of turnover of other types of assets, classified by degree of liquidity.

(b) *The structure of debt.*—Knowledge of the term-structure of debt maturities is needed for monetary and fiscal analysis and management. Total potential sources and uses of funds are important in analyzing money market conditions and in formulating policy where necessary.

(c) *The relationship of assets to debt.*—The ratios of debt to tangible wealth in the consumer, Government, and business sectors help to supplement the interest-income ratios in assessing the soundness of

<sup>2</sup> See "The National Economic Accounts of the United States," pp. 249-50.

debt positions. Debt-equity ratios are also helpful in analyzing secular and cyclical financial developments and in forecasting demand in the light of projected debt repayment burdens.

(d) *The density of financial activity.*—The financial interrelations ratio (the proportion of tangible to financial assets in balance sheets) is a measure which may reveal developing imbalances in the economy.

#### SPECIAL USES OF SECTOR AND INDUSTRY ESTIMATES

Many of the sector working group reports in appendix II discuss special uses of wealth estimates for these sectors or industry groups. Some of those uses will be indicated here.

*Governments.*—Within Federal, State, and local governmental agencies, it is obvious that the underlying property records are essential to property management—purchase and sale of inventory items—and to longer term capital budgeting. For purposes of rational budgeting, in general, estimates of depreciation and an imputed interest charge on capital are necessary ingredients of realistic cost estimates. These, in turn, are necessary for decisionmaking. Estimates of capital stocks and services also give the taxpayer a fuller picture of the services he is getting in return for his tax payments. Estimates of that portion of wealth located in each jurisdiction which is tax exempt give the tax authorities a clearer notion of taxes foregone. Knowledge of total assets also is of obvious value in framing policy and projecting yields from certain types of taxes, such as estate, inheritance, and capital gains.

At the State and local level, estimates of capital in relation to costs or output by function also permit comparisons among similar units which may help to raise standards in below-average areas (for example, public school plant per pupil). Federal Government performance, can, of course, not only be compared among agencies, but also central governments in other countries for similar functions.

With respect to national defense, the usefulness of international comparisons of the growth and structure of wealth have been mentioned. More specifically, the Office of Civilian Defense conducted its own inventory of buildings in connection with the shelter program. The National Resource Evaluation Center in the Office of Emergency Planning is interested in all productive resources, including capital assets “\* \* \* for predicting and monitoring the status of resources under all degrees of emergency, for identifying resource deficiencies and feasible production programs, and for supplying resource evaluations at national and subordinate levels to support mobilization base planning, continuity of government, resource management, and economic recovery.”<sup>3</sup> For OEP purposes, it is clear that wealth data should be collected on an establishment basis, in terms of considerable geographical detail.

*Net foreign assets.*—Knowledge of foreign-owned assets in any country aids in the analyses of the role of foreign capital in economic growth and development. This is particularly important in analysis of development of the economically less developed countries, where foreign capital frequently has a large role to play. In conjunction

<sup>3</sup> Executive Office of the President, OEP Circular 6500.1, Jan. 17, 1964.

with profit estimates, the foreign asset estimates (particularly of direct investments) permit the computation of relative rates of return on investment which help explain, and direct, international capital movements.

Quite comprehensive data on foreign assets in the United States and on investments by U.S. residents abroad are required for adequate analysis (and even computation) of the balance-of-payments position. That is, the structure of assets and liabilities, in terms of relative degrees of liquidity, is an important part of any appraisal of that position. The expansion of asset and liability data, recommended by the working group, would further narrow the "statistical discrepancy" in the balance of payments estimates, permitting identification of additional factors influencing gold movements.

*Households.*—Estimates of tangible as well as of intangible wealth of households permit more accurate wealth-size distributions of households than those previously made which were based largely on financial assets. Asset holdings, in turn, permit fuller analysis of consumer spending, and saving behavior.

Some stock data, by age, are already collected by various trade associations due to their value for market analysis. To the extent that a household inventory adds to knowledge of consumer holdings, it contributes to that end. This would be especially true of stocks of semidurables and perishables, about which least is known. The contribution of household inventory data to national defense planning is obvious; surveys of days supplies of food inventories have occasionally been made.

As in governments, estimates of household stocks permit estimates of depreciation of durables, and imputed interest on all tangibles, thus permitting more comprehensive analysis of personal income and consumption.

*Business.*—Managements of firms or establishments in each industry are interested in comparing their productivity, rates of return, and various financial ratios with industry averages, and with firms and industries abroad if data are available. Suppliers of equipment to each industry are interested in data on the status of the stocks of equipment, age, rates of growth, and so forth. Economic analysts are interested in the changing relative position of each industry in total wealth, in relation to associated variables.

But there are also special interests in wealth data in each industry. For example, in extractive industries there is interest in the role of reproducible capital in offsetting the tendency toward diminishing returns to land. In capital-intensive industries, such as the utilities, there is special interest in the load factor, and changes in the rate of utilization of capacity as it affects productivity. In some areas, such as the nonprofit sector of the service industries, there is interest in obtaining wealth data to assess its relative importance, since few asset data are now collected.

In certain industries, it is found to be analytically useful to relate output and other variables to certain physical wealth measures. Thus, in agriculture yields per acre, and yields per animal unit, are computed; in transportation, freight or passengers carried per vehicle (of various types) in absolute terms, and relative to capacity, are

meaningful. In retail trade, sales per square foot of floor space are computed. In the working group reports still other special uses are indicated.

#### STATISTICAL USES

Occasional benchmark estimates of tangible wealth serve as a check on estimates of net investment obtained from different sources. Investment estimates can, of course, be used as a means of extrapolating the benchmark estimates, but in this case, the occasional benchmarks are needed to keep the perpetual inventory extrapolations from developing serious biases (see ch. 3). In the case of flow of fund estimates, the annual figures are, in many cases, obtained as changes in yearend balance sheet estimates.

As mentioned earlier, the stock of consumer durables, and Government capital, can serve as the basis for estimating the value of the services of these stocks of wealth which are consumed over time. Estimates of these direct services of durables contribute to more comprehensive estimates of national income and product.

Real stock estimates have been used by a number of investigators as an indirect means of estimating capacity output in various industries (see ch. 4). In conjunction with actual output estimates, stock figures aid in the computation of rates of utilization of capacity.

In general, integration of balance sheet estimates with the income and product accounts provides additional avenues for cross-checking estimates, and generally improving reliability of the national economic accounts.

#### SUMMARY

Wealth estimates are needed in many types of general economic analysis: of economic growth and fluctuations, productivity changes and differences, capital goods markets and general demand, differences and changes in rates of return, financial conditions, size-class holdings, and tax impacts. They provide a dimension not available in the income and product flow estimates, and help improve the accuracy of the latter.

The analyses made possible by comprehensive wealth estimates together with other variables contained in the national accounts provide a richer background for economic projections and policy formulation than is now available. As has been true of the national income and product estimates, however, once wealth and balance sheet estimates become regularly available, uses for them will develop that cannot now be clearly anticipated.

The greater the detail in which the estimates become available, the greater the range of potential uses. Since increasing detail must be purchased at an increasing cost, a balance must be struck around the point where the cost of additional detail begins to offset the additional value.

## CHAPTER 3

### EXPERIENCE WITH WEALTH INVENTORIES AND ESTIMATES

Crude censuses of wealth in the United States were taken for selected years between 1850 and 1922. Thereafter, a number of sets of wealth estimates were made, based on scattered data. These efforts will be reviewed with regard to their implications for a comprehensive inventory of national wealth in the future.

The Japanese wealth surveys of 1955 and 1960, and the Soviet inventory of 1959-61 will also be reviewed for whatever lessons they hold for the planning of a wealth inventory in the United States.

#### HISTORICAL UNITED STATES CENSUSES OF WEALTH

Censuses of wealth were taken in the United States for the 9 years 1850, 1860, 1870, 1880, 1890, 1900, 1904, 1912, and 1922. The first six were each authorized by specific laws; the last three were taken under the general authority of the 1902 permanent census law. Collection and assembly of comprehensive data and the estimation of wealth were dropped by the Census Bureau after 1922 for reasons that will become apparent as we briefly review this early experience.

For the first three censuses from 1850 through 1870, the estimates of U.S. wealth were obtained in two steps. Counties reported the assessed values of all taxable real and personal property to the Census Bureau. Then, estimates were obtained from local marshals as to the average ratio between market and assessed values in the counties; these ratios were applied to the assessed values in order to raise them to market values. In 1870, an undetermined amount was added to the values of taxable property by the marshals to cover exempt personal property.

The early censuses had the virtues of approximating market valuations, and comprising data which could be presented on a State basis (1850 and 1860) or on a county basis (1870 and 1880). Shortcomings included the facts that the extent of coverage of all tangible property was unknown owing to lack of knowledge of the coverage of exempt property (particularly personal effects); an unknown degree of enforcement (some personal properties were apparently overlooked by assessors); coverage by some counties of intangibles such as mortgages; and inconsistency among counties in the detail obtained and reported with respect to types of property so that only an aggregate estimate could be reported nationally.

The unsatisfactory state of the estimates, particularly for the personal property component, led to adoption in 1880 of a new approach by the Census Bureau. Real estate values continued to be estimated by a blowup of assessed value, but the adjustment ratios were estimated by Census agents instead of marshals, which presumably re-

sulted in better estimates and a more precise knowledge by the Bureau of the coverage of the data. Personal property, however, now began to be estimated from a variety of sources other than local tax authorities. The chief direct source was the book values reported in the economic censuses of several industries conducted by the Census Bureau, which in 1922 covered agriculture, manufactures, mining, communications, and (together with the Interstate Commerce Commission) much of transportation. Other governmental sources included reports to the Departments of the Treasury, Commerce, Labor, and Interior. Missing pieces, such as household goods, inventory stocks, and capital of certain utilities were estimated by Census Bureau authorities. The methods were often crude, such as the capitalization of current net income at 5 percent (for a utility), or a ratio to the dollar volume of sales (certain inventories), or imputation of an average value per family in the case of household wealth.

The approach followed from 1880 to 1922 had the advantage of a much more certain scope of coverage of the numbers, together with some detail by industry and type of property, particularly if the collateral economic censuses were consulted. Further, a geographical breakdown by State was maintained. Nevertheless, serious shortcomings were evident. The broader base and greater detail were purchased at the cost of considerable scrambling of valuations. To market values of real property was added a large dose of book values in original cost, both gross and net of depreciation, without indication of dates of purchase. There was also a small sprinkling of other valuation types. Estimates continued to be crude in some areas, particularly household goods, properties of governments and nonprofit organizations, and nonreproducible wealth for which understatement was general. Owing to the lumping of all real property, complete industry breaks were not feasible. And while there were a fair number of categories, they were spotty and contingent more on data availabilities than on usefulness. Nevertheless, data on assessed values of realty, which continue to be collected along with market values for a sample of properties, could serve as a check on real estate aggregates estimated by alternative methods.

As Mr. Hoenack, the author of appendix I, part B, cogently points out, the Census estimates were made without social accounting objectives in mind; indeed, without a clearly thought out plan of what wealth estimates were wanted and why. Realizing the inadequacies that made the estimates of little use, Census Bureau officials decided to discontinue wealth estimates. But in the meantime, basic asset data have expanded, social accounting has blossomed, and interest in wealth data and estimates has grown.

It is apparent that the approach and methods followed in the old censuses of wealth would not generally be applicable in a new inventory. In the first place, a more clearly defined structure is needed, in terms of sectors, industries, and types of wealth (see ch. 4). This would preclude the use of blownup assessed property values as a primary approach, although the adjusted value of real property should be considered for use as a possible check on estimates obtained directly from respondents. The Census Bureau continues to collect data on assessed values, and also the market values as well for geographical samples of properties which have been traded in the previous



year. The Bureau obtains the data for a few broad industrial breaks, and these might be elaborated. In the case of personal property, however, coverage is too spotty and ill defined to give promise of use even as a check.

The integration of industry census and related data in the later wealth estimates (1880-1922) was a move in the right direction. But it is not acceptable to mix original costs with market values or approximations thereto. The inventory would have to collect data required for approximate revaluation to market value or replacement cost (see ch. 6). Further, at least broad categories of assets by type, as well as by industry, are needed.

Finally, a new inventory should be planned to be comprehensive, or if less than comprehensive, its precise boundaries should be clear. It was known that certain sectors and types of wealth were omitted altogether but the precise coverage of the old censuses was ambiguous. The need for developing a comprehensive and consistent framework prior to data collection is clear.

### UNITED STATES WEALTH ESTIMATES AFTER 1922

The additional basic data on assets that have become available since 1922 are reviewed in some detail in chapters 8 through 11 as a basis for pointing up the remaining gaps and weaknesses. A more extensive summary of wealth estimates based on the existing data is given in the final section of appendix I, part B. Here we are more concerned with general method and the implications with respect to planning data improvements. An evaluation will be given following a review of the several sets of estimates.

### EARLY ESTIMATES

Between 1922 and World War II, the several sets of wealth estimates that appeared were based largely on the same framework and underlying data used for the wealth censuses of 1922, but with some refinements. The Federal Trade Commission in 1926, in "National Wealth and Income" presented new wealth estimates for 1922. Several more detailed classifications were added, and land was separated from improvements for seven classes of real estate based on separate assessment data from nearly half of the State commissions. The FTC had wished to convert all book costs from the census into consistent market value or depreciated reproduction costs. The revaluation was carried out only for railroads, street railways, communications, and public utilities where it could be based on Interstate Commerce Commission and State public utility commission data showing relationships between original and current costs.

Robert Doane, in "The Anatomy of American Wealth," provided estimates for 1922, 1930, and 1938 similar to those of the FTC. He made additional use of Bureau of Internal Revenue (BIR) asset data from "Statistics of Income," and modified the assessment ratio procedure for 1938. In an earlier work, Doane had published annual estimates 1909-32, using primarily census data, but also estimates from the Department of Agriculture, ICC, and trade associations, as well as BIR. The National Industrial Conference Board also pub-

lished estimates of wealth in "Studies in Enterprise and Social Progress" (1939). The census approach was likewise followed by the Board, although the estimates were made on an annual basis for the years 1922-37.

#### RECENT ESTIMATES

After the war, several major studies of wealth, or capital, in the American economy were made, breaking new ground in methodology but all limited by inadequacy of basic data. First, there were Raymond Goldsmith's national wealth estimates for the years 1896-1949 in "A Study of Saving in the United States," volume III, revised and updated for the period 1945-58 for the National Bureau of Economic Research in "The National Wealth of the United States in the Post-war Period."

For the chief category of fixed reproducible assets, Goldsmith used the method of deflating annual capital outlays, by broad types, depreciating these using Bulletin F lives, then cumulating real net investment and reflating into current dollars—the method he popularized under the label of "perpetual inventory." For nonfarm inventories, he used census book values, since relatively little adjustment for price change was needed until LIFO-type methods began to spread. In farming, census data made possible the multiplication of physical units of the various types of crop and livestock inventories by appropriate unit prices.

Likewise, acreage of farmland could be multiplied by average values per acre. But nonfarmland values had to be estimated indirectly as ratios to values of structures. Estimates of the values of other natural resources, particularly subsoil assets, were even rougher.

The other major private works on wealth, or capital stocks, were the several volumes on major capital-using sectors of the economy in the series on capital formation and financing, which were capped by the summary volume by Simon Kuznets, "Capital in the American Economy," all sponsored by the National Bureau of Economic Research under a grant from the Life Insurance Association of America. The sources and methods underlying the sector volumes have been admirably summarized by Daniel Creamer.<sup>1</sup> Here, it suffices to note that two basic methods were used. The cumulation of annual net investment (perpetual inventory) was the basic method used in the regulated industries (based on capital formation data that came largely from the regulatory agencies) and for residences (based on annual value put-in-place estimates derived from permit and "starts" data).

Reflated asset data, from censuses and Bureau of Internal Revenue balance sheets items, were used for agriculture, mining, and manufacturing. In the latter two industries, the fixed assets data were in book values. To reflate to current prices required capital goods price indexes, the values for each price year weighted by the estimated proportions of current capital stock purchased in those years.

Kuznets' fixed reproducible wealth estimates for the total economy were based on the perpetual inventory method, using his capital formation estimates. Comparison of Kuznets' aggregate for the private economy with the sum of the largely independent sector estimates show

<sup>1</sup> See "Output, Input, and Productivity Measurement," vol. 25, "Studies in Income and Wealth."

a reasonable correspondence of long-run trends but significant differences in decade-to-decade movement.

Other comparisons, by Creamer and Goldsmith, of sector estimates derived from the asset approach with cumulated investment estimates indicated fair correspondence of levels and secular trends, but again discrepancy of shorter term movements.

A final set of estimates should be mentioned. For some years, the Office of Business Economics has published an annual series on the real stock of structures, equipment, and inventories in manufacturing, the fixed stock estimates being derived by the perpetual inventory method.<sup>2</sup> More recently, fixed capital stock estimates were presented for the business economy (including nonprofit institutions) for selected years 1929-61, broken down by structures and equipment for the farm, manufacturing, and "other" sectors.<sup>3</sup> The basic perpetual inventory method was used, but the distinguishing feature of these estimates is that they were prepared in several variant forms, involving alternative assumptions with respect to: lengths of life (Bulletin F lives, and lives of 10, 20, and 40 percent shorter); depreciation (straight-line, 1½, double, and triple declining balance method, and sum of the years-digits method); price deflation for equipment and structures from the corresponding national product segments, and overall GNP deflator for structures rather than the construction cost deflator, and a 1 percent a year adjustment to the deflator to allow for unmeasured quality improvement.

A short-cut method based on gross investment for only eight categories was used, with average service lives assumed for each rather than a dispersion of retirements around the averages. After the 1964 revision of the GNP is completed, it is contemplated that the estimates will be redone, with fewer variants and using separate distributions of lives for more than 40 types of equipment and structures.

In the meantime, the OBE has experimented with developing variant estimates of the stocks of equipment and structures for most of the two-digit industry groups. Capital outlay estimates were obtained by differencing IRS balance sheet estimates, adding depreciation, and adjusting to an establishment basis using census controls. This made possible corresponding fixed tangible capital estimates by the perpetual inventory method.

#### IMPLICATIONS OF THE U.S. WEALTH ESTIMATES

If the perpetual inventory method is used for annual extrapolations of benchmark wealth estimates, it is obvious that good estimates of gross fixed capital formation are needed. These have been better in recent than in earlier years, but considerably more detail by industry, and possibly by type of asset, is needed to make the estimates more useful. Even if the book-value approach is used for annual estimates, capital formation data are needed as a means of weighting the price deflators.

<sup>2</sup> See *Survey of Current Business*, December 1954. Somewhat similarly based estimates have been prepared for some years by the Machinery and Allied Products Institute for all plant and equipment.

<sup>3</sup> *Survey of Current Business*, November 1962.

It is also apparent that price indexes corresponding to all the major types of construction and equipment are required. Although capital goods deflators have improved since World War II, more asset-price data are needed. Also much more needs to be known concerning lengths of life of depreciable assets, and the typical pattern of depreciation. The OBE studies show that alternative assumptions on these variables make considerable difference in the resulting stock estimates.

But the chief need with respect to continuing perpetual inventory estimates is for a benchmark inventory in sufficient detail to establish the level of fixed reproducible wealth at a point in time. Perpetual inventory estimates can do well in extrapolating and interpolating benchmark data, but they need a level to begin with and to be corrected at reasonable intervals, such as a decade. As is developed in chapters 4 and 5, the inventory must contain considerable detail classifying type of asset, by age (information not now given in most available book-value data), for purposes of revaluation as well as for its intrinsic interest. Such information would indicate the assets still in use at a given point in time, whereas the perpetual inventory can be misleading if the retirement curves that are applied to prior years' investment are inaccurate. As Goldsmith has commented " \* \* \* we need at least one benchmark estimate of capital stock in the postwar period as we otherwise have no way of controlling the figures obtained by the perpetual inventory method."<sup>4</sup>

The next two sections of the report review two postwar efforts abroad to conduct wealth inventories—one on a universe basis by the Soviet Union; the other on a sample basis in Japan. Wealth estimates based on fragmentary data have been made in many foreign countries on a one-time or occasional basis. These generally have used similar methods and faced problems similar to those we have noted in connection with recent U.S. estimates.<sup>5</sup> But we have something to learn from the comprehensive inventories to which we now turn.

### THE SOVIET WEALTH INVENTORY

At the end of 1959, an inventory of reproducible, fixed assets was carried out in the Soviet Union, covering all state and cooperative enterprises except collective farms. About the same time a housing census was taken. In the last quarter of 1961, a similar inventory was carried out for the collective farms. Excluded were private capital goods other than houses, and administrative institutions supported by the state budget. Partial inventories had been taken since 1925, but the 1959-61 inventories were by far the most exhaustive and systematic. More than 100 million items were covered, and 3 million people participated, from the ministries and other governmental agencies down to the network of commissions set up in each enterprise to assume responsibility for the reporting.

There were several major purposes of the inventory. At the micro-economic level, the inventory involved a consistent revaluation of all

<sup>4</sup> "Output, Input and Productivity Measurement," p. 445.

<sup>5</sup> See "The Measurement of National Wealth," series VIII, "Income and Wealth", edited by Raymond Goldsmith and Christopher Saunders. Wealth estimates of varying scope are presented for the following countries: Belgium, Luxembourg, the Netherlands, Western Germany, the United Kingdom, France, Sweden, Norway, Yugoslavia, Canada, the United States, Mexico, Australia, South Africa, Argentina, Colombia, Japan, and India.

fixed assets ("funds") which made possible consistent balance sheet estimates, and depreciation or capital consumption estimates, and thus more accurate determination of unit costs, prices and profits, and more efficient management and investment planning.

Microeconomic estimates would not only benefit from the consistent enumeration and valuation of fixed assets, but the summary wealth estimates would make possible analysis of aggregate wealth and its structure according to types or uses, administrative sectors, branches of industry, and geographic regions. Particularly mentioned in Soviet literature were the ratios of fixed funds to output, to labor, and to working capital, as useful in analysis and planning.

#### PREPARATORY STEPS AND BASIC DOCUMENTS

There was careful preparation for the inventory. In 1958, a sample inventory of machinery and equipment was taken in 17 major industries. In May 1959, instructions were issued to ministries, departments, regional groups, and enterprises. Instructional conferences were organized by the Central Statistical Administration.

Emphasis was placed on bringing the documents relating to capital goods in the enterprises up to date and in good order. As pointed out by Mr. Kaufman in appendix I, part D, the Soviet accounting system requires two basic documents for all machinery and equipment: a technical "passport" describing the item, and an inventory card providing data on original cost, timing and expenditure for repair, modernization, etc. Documentation for buildings and structures was less complete. Each item was assigned a code number based on a standard classification.

Detailed instructions prescribed a uniform procedure for filling out the census blanks and forms. The basis forms were inventory lists for five main groupings of assets in each enterprise or productive unit. In general, the following information was filled in: Code, description of object, year produced or acquired, year(s) modernized, quantity information such as cubature or square meters of building space by type, original cost, replacement value (and difference relative to cost), wear and tear as percent of replacement value and in rubles. The headings of the reports, in addition to name of enterprise, included administrative attachment (ministry, department, Sovnarkhoz, and regional executive committee, economic sector, industry branch, kind of production, and address in terms of republic, oblast, city, and district (rayon).

The inventory lists served as the basis for summary reports by 55 major types of assets, by administrative organizations, by sectors and industrial branches by type and by geographical groupings.

#### CLASSIFICATIONS BY SECTORS AND TYPES OF ASSETS

Classification by sector and industry was based on the establishment principle. The primary product or activity of the establishment determined the branch to which it was assigned. Auxiliary units of enterprises were put in their corresponding industry. Transportation facilities were assigned to the industries to which they were attached,

however, rather than to the transport industry. The same was true of communication equipment. The principal sectors are:

1. Industry.
2. Construction (including contract and force-account construction and project-making organizations).
3. Agriculture (including forestry).
4. Transportation.
5. Communication.
6. Procurement.
7. Material-technical supply and sales organizations.
8. Trade and public catering.
9. Housing (including hotels and hostels).
10. Municipal services.
11. Public health, physical education, and social insurance.
12. Education, science, arts.
13. Others.

Each sector is further subdivided. For example, "industry" (mining and manufacturing) is broken down into 13 major groups, and many additional subgroups as shown in annex VII to Mr. Kaufman's background paper, appendix I, part D.

The various types of fixed assets were classified into 13 main groups, again with many breaks not shown below, but indicated broadly in appendix I, part D.

1. Buildings—by four types of construction and by the following four major uses:
  - (a) Buildings for direct production.
  - (b) Buildings serving production indirectly (storage, construction, transportation, etc.).
  - (c) Buildings providing services.
  - (d) Residences.
2. Structures.
3. Transmissions (peredatochyne ustroistva).
4. Power machines and equipment.
  - Automatic machines.
5. Operating machines and equipment.
  - Automatic machines.
6. Measurement and control devices and laboratory equipment.
7. Transportation equipment.
8. Tools (instrumenty).
9. Productive and household implements and accessories.
10. Draft and productive livestock, other animals, poultry, and apiaries.
11. Perennial plantings.
12. Land improvements, ameliorations, and waterworks.
13. Other fixed capital.

A distinction was made between groups of general purpose assets which are found in several sectors or industries, and special purpose assets which are used in only one sector or industry group. Lists of specialized assets were prepared for many industries.

## REVALUATION

Soviet economists recognized the defects of book value data on fixed assets, which reflected original cost. Since capital goods and construction prices were changed substantially from time to time, there were significant discrepancies in the book value of identical fixed assets among enterprises. This causes the book value and depreciation estimates to be misleading for interindustry comparisons of assets, capital coefficients, capital consumption, and unit cost. The revaluation used in earlier inventories had been subject to criticism, so considerable pains were taken in planning for revaluations in the 1959-61 inventories.

Revaluations were carried out generally, but with the exception of short-lived assets or assets purchased after July 1, 1955, the last date of price change prior to the inventory. Some types of assets whose revaluation was especially difficult, such as land improvements, were also included at book value. In general, it was attempted to revalue all other fixed assets at the prices of July 1, 1955 (although the 1961 census employed the new prices for agricultural equipment introduced February 1, 1961).

For purposes of revaluation, 138 price handbooks were compiled directly quoting the July 1, 1955, prices of most kinds of machinery and equipment. For buildings, structures, and transmission installations, the handbooks provided "generalized indicators"—the cost on July 1, 1955, per basic unit of building or other structure—such as the cost per cubic and/or square meter, or linear meter in the case of pipelines, broken down by detailed type or quality of construction. The costs were inclusive of all elements, including design, foundations, labor, materials, overhead, etc. Prices and unit costs were given for the most important of the 5 zones for equipment and the 10 zones for construction into which the U.S.S.R. was divided; in other zones standard adjustment coefficients were applied.

The important problems of depreciation, including both obsolescence owing to advancing technology and to physical wear, were handled in two operations. The treatment of obsolescence also, in effect, covered the problem of adjusting the replacement cost (price) of older models of capital goods relative to the models being produced and priced as of 1955.

The prices of older models of machines were reduced relative to the latest 1955 models according to two criteria. One adjustment was based on relative efficiency or performance as indicated by differences in output capacity or unit-input requirements (for power, raw materials, labor, etc.). A number of specific examples of adjustments are given in the appendix by Kaufman. The same type of adjustment is made in determining the base price of imported goods, or obsolete goods, not produced in the Soviet Union in 1955. That is, capacity or efficiency comparisons are made against similar goods that were domestically produced at the revaluation date. In effect, this type of adjustment is a substitute for market prices of old and new goods reflecting relative present values of anticipated future net income—which presumably is also roughly reflected in the usual kind of depreciation allowances on fixed assets as they age.

The second type of adjustment (which has no counterpart in the United States) is to reduce the replacement price of an old machine in proportion to the decline in its unit real cost between the time of its installation and the base period. This adjustment would be quite questionable by Western standards, but in practice since productivity in the capital goods industries was presumably increasing over time it added an additional decline in value which probably caused the total adjusted value of older equipment to approximate more closely the value that would have emerged from the more conventional application of depreciation rates.

In addition to adjustments for the two types of obsolescence, engineering estimates of the degree of wear and tear on aging equipment and structures were made on an item-by-item basis. In order to reduce subjectivity and arbitrariness in the work of the experts, detailed instructions were issued indicating what should be inspected and the symptoms of wear. The percent of wear and tear was estimated for each component of a given asset, and guidebook weights applied to the percentages for the several components to obtain a weighted average percentage for the asset as a whole. When inspection was not feasible, wear was estimated as the elapsed percentage of estimated service life.

#### CRITIQUE

From the viewpoint of what could be learned in the United States or other predominately market-directed economies from the Soviet inventory, as well as in terms of its own objectives, several points can be made. In the first place, the exhaustive and detailed character of the Soviet inventory appears to have had the primary purposes of improving the capital accounts, the estimation of the capital portion of unit costs, and investment planning for individual enterprises and industries. While property management and accounting procedures could probably be improved in the private sectors of Western economies, a national inventory and revaluation would not be the appropriate means of accomplishing the objective.

On the other hand, the rich summary data that emerged from the Soviet inventory with respect to aggregate fixed wealth, valued on a more or less consistent basis, classified by sector, industry, class of assets, and region, represent the kind of macroeconomic statistics that would be very useful for analysis of a predominately free enterprise economy as well as a socialist one. The types of policy decisions based on the estimates and analyses would differ, of course, comprising measures to influence desired actions toward democratically determined goals in the former case, and directives to implement centrally designed plans in the other. Again, less detailed data would be needed for economic policy in a market-directed economy than for the making and execution of plans in a socialist economy.

Even the Soviet inventory was not complete, of course. The omission of most private property might not be serious there, but the omission of land and natural resources represents a major gap.

The elaborate and costly method of revaluing assets was necessitated in part by deficiencies in the Soviet system of price relatives, particularly for capital goods. It is doubtful if the constructed prices or unit values are as economically meaningful as prices established in markets,



or prices contrived to approximate market prices as a standard. The adjustments for changes in output capacity or unit real cost of outputs of new compared with old models is only a very crude approximation for changes in capacity to contribute to future net income. The adjustment for changes in productivity of capital goods industries has no basis in theory, unless one wishes to equate real output with real input cost, or real stock with real cost of reproduction or replacement; but in practice it approximates a gradual depreciation allowance, but probably too small a one except for very long-lived assets. The wear and tear estimate is also an approximation to depreciation, but on a purely physical basis. The physical life of an asset is usually much longer than the economic life, given proper maintenance and repair. Even after the several adjustments noted, it seems likely that the Soviet revaluation resulted in an overvaluation of old assets—and thus in a significant overvaluation of the total capital stock.

The Soviet adjustments for obsolescence were made entirely for changes in supply conditions, not for changes in demand which would cause more rapid depreciation in the value of some types of equipment than in others. This is not surprising in an economy which is not geared to consumer sovereignty. Insofar as planned changes in production rendered some specialized types of equipment obsolete, presumably such items would be discarded from the stock. But shifts of equipment to less valuable uses would not be reflected in the adjustments.

There is a further question as to how well the July 1, 1955, relative price structure reflected the relative unit costs (let alone the relative present values of future net income streams) of capital goods. The pending Soviet price reform suggests that the price relatives were not ideal, even from their point of view. Certainly, the use of 1961 prices for agricultural machinery, and original costs for certain other types of goods, especially structures, resulting in further distortion of the relative prices underlying the aggregates.

Despite its shortcomings, the Soviet census is to be credited for its thorough preparation and execution. It is to be hoped that a U.S. census would be as well planned on the more aggregative basis that would seem more appropriate to our type of economy, and which would entail far less cost than the Soviets undoubtedly incurred for their exhaustive item-by-item inventory.

#### THE JAPANESE WEALTH SURVEYS

Beginning in 1905 in Japan, systematic wealth estimates were made occasionally, based on existing data. In 1930 and 1935, estimates were made by the Statistics Bureau of the Prime Minister's Office based on existing data on both production and assets and supplemented by field surveys as required. Between 1935 and 1955, the only wealth data gathered were in connection with "A Survey of Losses and Damages During the War" carried out by the Economic Stabilization Board in 1947. Objectives of a new wealth survey included analysis of the structure and distribution of national wealth, economic growth and the relation of capital to output, and international comparisons.

In 1953, the Economic Planning Agency set up a National Wealth Survey Committee of experts to develop general guidelines for a com-

prehensive survey. The following were their main recommendations: Wealth estimates should be consonant with the national income accounts; definitions and classifications given in the U.N. document, "A Standard System of National Accounts," should apply, with at least as many sectors distinguished; detailed asset classification should be uniform, and as much industry detail collected as funds permitted; consumer durables, but not household stocks of perishables, would be included; an objective method of valuation should be used—generally depreciated replacement cost; the tax returns of corporations should be used to the extent possible in order to reduce the reporting burden; and data should be collected on an ownership basis.

#### SCOPE AND CLASSIFICATIONS

The wealth survey covered nonhuman tangible reproducible assets located in Japanese territory as of the end of 1955, and the balance of assets located abroad held by Japanese residents and their liabilities to foreigners. Excluded were land and natural resources and man-made nonreproducibles such as books and art objects, owing to difficulties of valuation. Nonbusiness inventories of nondurables were also excluded because of the difficulties of data collection. Durables were defined as goods having more than 1 year of service life, although as a practical matter some small tools charged to current expenses, as well as durables having less than a minimum value, were omitted.

Appendix I, part E by Mr. Y. Shimizu, indicates the 10 major groups, and some of the subgroups, into which tangibles were classified; and the 4 major classes of inventories. Actually, data were collected in great detail by type of asset, by sector, for purposes of revaluation. The consolidations by broad groups were made for publication. The coding of individual assets was done according to a publication, "Classification Rules for Assets," issued as a guide for supervisors in connection with tabulation.

The Japanese economy was divided into the following chief sectors for purposes of the survey and design of the samples: Central government, local governments (each including governmental corporations and other enterprises), private corporations, and nonprofit institutions, unincorporated business, households, and community properties. Within the business sector, establishments were grouped according to standard industry classifications.

#### PROCEDURES—GENERAL AND BY SECTOR

For a year before the field survey, there were several pilot surveys designed to help determine several things: the design of the final schedules; the extent of use made of data provided for asset revaluation; the degree of correlation between reported invested capital of companies and the adjusted replacement value of assets; methods of collecting data for smaller corporations, for compiling up-to-date lists of unincorporated enterprises and overcoming deficiencies in their asset ledgers; with respect to households, determining methods of separating business assets, determining the scope of household assets that could be surveyed with reasonable accuracy, and a method to compute the value of total household durables from the value of selected durables.

It was found that tax data submitted by corporations could be used effectively as transcribed by government employees, and that there was a high coefficient of correlation between invested capital and estimated replacement cost of assets. On the other hand, the asset ledgers of proprietors were generally incomplete, so enumerators were needed to fill in reports for this sector. Great difficulties were found in trying to allocate assets between household and business in cases of joint-use, but percentages of floor space, and of time used, were indicated as guides. Eighty-three durables were selected as representative of household tangible wealth.

In preparation for the field surveys, the chiefs of the Prefecture statistical offices held meetings; issued manuals on various aspects of the surveys—checking, tabulation, editing; and conducted training of enumerators.

The surveys themselves were based on scientifically stratified samples. Both direct and area sampling were used. Corporations, for example, were stratified into five groups according to size of invested capital (reported in a 1954 establishment census): All of the relatively small number of corporations with the largest capital were surveyed, but with progressively smaller drawing ratios as the invested capital brackets fell. Geographical areas were stratified into six groups according to the largest capital of a company located in the city, town, or village. In all, 63,000 establishments were selected.

The survey covered 17,000 proprietors in about 1,000 of 300,000 enumeration districts. Drawing ratios differed depending on the industry. Approximately, 7,300 households were selected from 978 districts in 528 cities, towns, and villages. All quasi-households of more than 90 people were surveyed. Of local governments, 433 were selected: all prefectures and cities or wards over 140,000; one-half of all places from 62,600 to 139,999; one-eighth of those between 30,000 and 62,599; and one-twentieth of all smaller places.

At the central government level, the various ministries and agencies, bureaus, divisions, and sections were stratified by numbers of employees and their property management units drawn at random.

*The schedules.*—For businesses, there were schedules for the head office, and/or establishment, for fixed assets, and for inventories. The name, address, business activity and number of the company were given; the code numbers for prefecture, city, town, or village; also the paid-up capital. In the fixed asset schedule, all items were listed by name, code, description of characteristics and use of asset, quantity by year of acquisition, original cost, assumed life, and estimated current value (or replacement cost). Addenda items included price index and depreciation rate used for revaluation by respondent.

Inventories were also filled in by type of item, number, book value and method of valuation, turnover ratio, and estimated replacement value. Many pages of both fixed asset and inventory schedules were, of course, turned in. As mentioned above, self-enumeration forms were used in the corporate sector in addition to transcription from tax returns; proprietorships were covered by enumerators. Essentially the same types of schedules were filled out by representatives of local governments, and central government agencies.

There were two chief schedules used for households. The first covered the residence in considerable detail—location, kind of building,

type of construction, floor space, proportion used for business, year of construction, cost and/or estimated value. If rented rather than owner occupied, the house was transferred to the real estate industry. The second household schedule covered the durables, asking for each the quantity, and the period of acquisition (pre-1925, 1926-40, 1941-45, 1946-50, and annually 1950-55.) Current average price lists permitted calculation of replacement values.

Following the basic field surveys, there were rechecks to follow up on nonresponses or replace respondents who presented special difficulties; to correct the variance among industries owing to area sampling; to spot check the coverage of tools, and to include major repairs and alterations which had not been reported; to obtain communal properties, such as woods, which had not been gotten in the local government survey; and, for households, to ascertain the proportion the value of the 83 durables bore to the total value of household durables, based on a small subsample of 600 households.

After the rechecking, adjusted replacement values were summed to asset groups, by sector, and the universe totals obtained by applying the inverses of the drawing ratios. For households, the estimated total value of durables per household was multiplied by the estimated total number of households. Assets were shifted between the household and unincorporated business sectors as indicated by the use ratios.

#### VALUATION

It has been noted that fixed assets were reported in terms of cost and period of acquisition in order to make possible adjustment to replacement value, and for depreciation. With respect to price adjustment, the Economic Planning Agency prepared price indexes for the various types of assets, and the ratios of 1955 prices to prices in each year from 1871 to 1955, for the use of respondents and the regional statistical offices. Some of the indexes were based on direct price, or unit value data, as for transportation equipment. But for some machinery and equipment, and particularly for construction, cost indexes were compiled based on weighted averages of prices of materials, labor, power, and overhead components. While the weighted averages were often elaborately constructed, they had the usual deficiency of cost indexes of leaving aside the effects of productivity advances as compared with true price indexes. Owing to lack of sufficient price or specific cost information, apparently rather extensive imputations were made by using price or cost indexes for one group of assets to approximate price movements in uncovered areas.

To provide a basis for the calculation of depreciation, the Bureau of Statistics in collaboration with the Ministry of Finance published "Lifetime Table for Tangible Fixed Assets, by Type of Asset and Industry of Use." This covered 12,000 items, the durability for individual assets based on those prescribed for tax purposes. Some other methods were used in special industry cases. When company asset records were unavailable, replacement cost was estimated directly. In households, units were generally multiplied by 1955 replacement prices for the various types of goods.

## THE 1960 INTERIM SURVEY

The Japanese plan has been to conduct another detailed survey in 1965, but to provide 1960 estimates based primarily on net investment estimates, but within the same general framework. Consequently, the 1960 survey used the same sectoring, classifications, ages, price indexes, and so forth, but the samples were smaller.

For the years from 1953 to 1960, respondents entered their gross outlays for fixed assets, depreciation, and discards, by broad asset groups. Inventories as of the end of 1960 were entered.

In addition, greater detail was obtained than in 1955 for certain types of governmental assets. On the other hand, the household survey was not repeated, although estimates of the value of residences were prepared from existing data.

*Evaluation of the Japanese wealth surveys*

The basic approach of the Japanese wealth survey of 1955, and the interim survey of 1960, is admirable. The use of the framework of the national economic accounts to provide the structure with respect to sectoring and asset groups, and sample surveys to provide the asset detail by type and period of acquisition for revaluation purposes, would seem to provide a basic model that could be followed and adapted for use by others. Despite the significant degree of correlation between depreciated replacement cost and book values of total fixed assets, however, greater accuracy might be obtained by obtaining book values at least by major groupings of assets in the complete industry censuses, with the samples used to provide the necessary detail within these groups. Regular universe census control totals are essential to support sample estimates of the universe.

The approach of the 1960 survey for extrapolating the sector benchmarks by gross and net investment data for the major asset groups seems desirable for national accounting purposes. The question arises, however, whether this could not be done by getting somewhat greater detail from the regular investment surveys, rather than using a special survey. In effect, this was what the Economic Planning Agency did in estimating the stock of dwellings in 1960.

If one were to judge from the available descriptions, the Japanese capital goods price indexes leave much to be desired. The omission of a productivity factor from weighted cost indexes has been mentioned; and cost indexes were used not only for buildings and certain other structures, but also for part of machinery and equipment. Unit values, used for some other items, are influenced improperly by changing mix within the product class to which the measure relates. Further work in improving price data would pay dividends in future years. The same is probably true of the length of life estimate, and depreciation rates contained in the handbook cited above.

The ownership basis underlying the Japanese survey (except for households) is the practical approach for collecting asset data. But due to the importance of a use basis of classification for production analysis, efforts should be made to collect the data necessary to a supplementary reclassification of assets according to use.

Various technical problems of the survey were noted by Mr. Shimizu, some of which would be amenable to correction in future surveys. In the first place, there were definitional difficulties in draw-

ing clear boundaries between general government and government enterprises; between private and communal property; and between household and unincorporated businesses.

It also became clear in the course of the surveys that improvements were needed in the basic property accounts of respondents, especially the unincorporated businesses (and households, of course). Even corporations did not carry certain classes of assets in their books, and classifications differed somewhat from those used in the national economic accounts. Even the property records and records of current capital outlays of the central government were not complete, and gaps were greater at the local government levels. This suggests the need for more educational work prior to subsequent surveys.

But in the broad, the Japanese wealth survey of 1955 and the extension to 1960 are useful prototypes for other countries planning statistical work in the field of wealth. Methodological improvements will be introduced both in Japan and elsewhere. The important thing is that a useful start has been made.

## CHAPTER 4

### THE DESIGN OF THE WEALTH INVENTORY AND ESTIMATES

From the beginning of the Wealth Inventory Planning Study, the staff and Advisory Committee have considered that a prime purpose of an inventory was the provision of basic data for wealth and balance sheet estimates within the framework of the national economic accounts broadly viewed.<sup>1</sup> The investment and financial flows in the accounts, together with revaluations, explain changes in the related balance sheets. Thus, the structure of the income and product accounts, as integrated with the investment and financial transaction subaccounts, determines the structure of the associated balance sheets and wealth estimates.

In chapters 4 and 5, we discuss the main characteristics of economic accounts as they affect the design of wealth statements and balance sheets, and thus of the data collections needed as a basis for stock estimates. The wealth inventory can and should provide much more detail by industry and type of asset than is published in national accounts, as will be developed below. But it is desirable for the detail to be collapsible into the broader categories used, or planned for use, in the economic accounts at the time the wealth inventory is blue-printed.

Unfortunately, there is not now one fully integrated system of economic accounts in the United States, although progress in that direction has been made. Early work in interindustry sales and purchase relationships (input-output) was done in the Bureau of Labor Statistics. But tables for 1958 are being prepared in the Office of Business Economics, on a basis consistent with the national income and product accounts. Thus, a disaggregation of domestic tangible wealth by industry consistent with the official production accounts could also be used in interindustry analysis.

In the case of sector capital accounts and financial flows, however, the development work—including partial balance sheets—was done in the Federal Reserve Board. Although this work has moved in the direction of greater consistency with the income and product accounts, some further modifications in both sets of accounts would be necessary to achieve a synthesis. The paper by Mr. Gorman of OBE (app. I, pt. F) demonstrates one way in which the present income accounts could be elaborated in the direction of capital accounts and balance sheets. The comments by Mr. Sigel of the FRB indicate that further discussion between the two agencies is needed to achieve a meeting of minds.

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<sup>1</sup> See "The National Economic Accounts of the United States: Review, Appraisal, and Recommendations" for discussion of a possible comprehensive integration of the several types of economic accounts.

The work of Raymond Goldsmith for the National Bureau of Economic Research on national balance sheets, by sector, differs somewhat in basic framework from that in the two Government agencies. It would be helpful in delineating detailed data requirements on assets and liabilities, by sector, if agreement were reached on the basic structure of accounts. This is preferable to the use of reconciliation tables. Apparently, there are not many major divergencies to be resolved. But resolution will require some changes in both sets of accounts. The discussion in chapter 4 must therefore relate to general features of the accounts, with reference to alternative approaches in some instances.

#### RELEVANT FEATURES OF ECONOMIC ACCOUNTS

The economic accounts have developed out of the need for summary statistics describing economic behavior which could be used in testing explanatory hypotheses. Theories of economic behavior, in turn, have influenced the structure of the accounts. The discipline of an accounting framework has been found to be advantageous in obtaining comprehensive and consistent coverage of the various sectors, demonstrating their interrelationships, making possible cross-checks (or derivation of some magnitudes as residuals), and pointing up data needs.

Mr. Jaszi, now Director of the Office of Business Economics, has put it “\* \* \* study of economic behavior calls for a comprehensive accounting system showing the economy in terms of an interrelated network of flows and stocks.” He sees the essence of the accounting approach as “the division of the economy into groups of transactors and the depiction of the economic process in terms of their transactions.” The distinction between current and capital account transactions is also viewed as fundamental.<sup>2</sup>

In what follows, we shall be particularly concerned with (1) the groupings of transactors into sectors or industry groups, and, (2) the classifications of transactions particularly in capital accounts, since related wealth estimates and balance sheets must have a consistent structure if they are to be used in conjunction with the flow accounts. Immediately, however, it becomes apparent that the structure of the accounts differs depending on whether one is interested in studying the production function of the economy and its component industries, or the process of income distribution, spending, saving, investing, and financing by the various transactors grouped according to common institutional and behavioral characteristics.

The heart of the national economic accounts, the production account, comprising sales of final products (including inventory accumulation) and the associated factor incomes and other charges against product, can be deconsolidated in two directions. On the one hand, domestic product may be deconsolidated into income and product originating by industry. On the asset side, domestic wealth can be viewed correspondingly as the sum of tangible assets used in all industries. Here, industries are defined in terms of collections of establishments producing a common range of products as will be discussed further below. Interest centers on the real tangible assets technically required for each industry's production.

<sup>2</sup> See “A Critique of the United States Income and Product Accounts,” pp. 21-22.



On the other hand, when interest centers on the factors influencing demand for final products—on income, current consumption, saving, investment, and financial transactions—a different sectoring is required. For income, demand, and financial analysis, transactors with similar motivations and responses are grouped primarily by institutional groupings or sectors—households, financial and nonfinancial business (corporate and noncorporate), and governments. Within the business sector, industries would be composed of collections of companies, since ultimate decisionmaking responsibility rests in corporate central offices in the case of multiestablishment companies.

Sector deconsolidation requires several activity subaccounts. Incomes from current production, plus transfer payments and other redistributions, are credited to sector appropriation accounts, and become the source of funds for spending or saving. Saving is credited to the capital account, and together with borrowing (net increase in liabilities) is matched by tangible investment and lending (net acquisition of financial assets).

The associated sector balance sheets thus include financial as well as tangible assets, liabilities, and net worth. When these are consolidated, domestic financial assets and liabilities wash out, and national net worth is seen to consist of domestic tangibles, net foreign claims, and the difference between the market valuation of going concerns and the market value of the underlying assets.<sup>3</sup>

It is the domestic tangible wealth, unadjusted for national residence of owners, which it seems appropriate to disaggregate by industry for production analysis.

In other words, national net worth may be deconsolidated into the component sector balance sheets, showing financial as well as tangible items, and sector net worth—to be discussed in chapter 5. Or, domestic net worth as tangible wealth may be disaggregated by industry of use, discussed in this chapter. The view has gradually spread in economic accounting circles that interindustry relationship accounts and the associated wealth and flow of funds accounts and the related balance sheets can each tie into the basic national production accounts even though a complete reconciliation with one another would be difficult, if not impossible.

#### DOMESTIC WEALTH BY INDUSTRY

Tangible wealth estimates by industry are useful in conjunction with industry output, or real product, and labor input estimates for deriving statistical production functions, average and marginal capital coefficients, estimates of real capital used per worker, analyses of the composition of capital by industry, and other production analyses. For these purposes, wealth must be estimated consistently with real domestic product, by industry.

Total domestic product is the sum of net value added in all the industries into which productive activities are divided. The outputs of the establishments of each industry are sold to other producing units, and to final demand sectors. In turn, managers of establishments purchase intermediate products from other industries, and the services of human and nonhuman capital from the owners of the basic

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<sup>3</sup> See ch. 5.

factors of production. These relationships can be shown in the form of a matrix. Upon consolidation, purchases and sales among the various industries cancel out, and sales of final products (gross domestic product) and purchases of factor services (gross domestic income) and other charges against product remain. For each industry, total sales plus inventory change (gross output) less intermediate product purchases equal product originating (sometimes called net output or net value added).

For production analysis, the tangible wealth (or capital) used in production should be allocated by the same collection of establishments or industries used to derive the gross and net output estimates. The capital stock used in each industry changes in each period as a result of gross investment less capital consumption, or net investment (allocated by industry of use) and changes in the value of survival capital.

#### INDUSTRY SECTORING

The industry sectoring for domestic income and product, and thus for domestic tangible wealth estimates, raises several major data collection problems. These are the matters of industry classification, establishment reporting and the treatment of leased assets.

*Classification.*—The standard industrial classification developed by the Office of Statistical Standards provides the basic classificatory system used in Federal reporting programs. The differences between the industry classifications used by OBE in its 1964 revisions and the latest (1957) revision of the SIC, as amended have become minor, involving chiefly a few rearrangements of industry groupings.

The working groups of the Wealth Study were set up along one-digit industry lines, for the most part.<sup>4</sup> In general, the industry groups favored tabulation of wealth data according to SIC classifications, although in some cases in less-than-four-digit detail. (See particularly the reports on the regulated industries.) Presentation of data and estimates would vary according to purpose, but all the data could be tabulated by fine industry detail. Publication of additional detail would involve relatively minor additional cost compared with the collection cost. In any case, the detail should be preserved in basic records.

It is with respect to preparation of estimates from the detail that judgment must be exercised as to the degree of detail which would be appropriate. In general, OBE publishes estimates by two-digit industry groupings. With the growing use of computers that can quickly handle large bodies of estimates for analysis, further thought should be given to the possible desirability of preparing estimates for finer industrial groupings if additional resources were available.

Members of some groups were of the opinion that certain current SIC classifications are out of date—in the agricultural services area, for example. There is also an especial need in a wealth survey to provide more separate industry classifications for firms or establish-

<sup>4</sup> Note, however, that the natural resources group covered not only mineral industries, but also forestry and fisheries, and considered the problem of natural resource valuation generally. The household group was set up mainly from the viewpoint of households as a consuming sector; while the two government groups considered governments in their dual capacity as producers and instruments of collective consumption. In addition to the domestic industry groups, the group on net foreign claims was necessary to provide the bridge from national to domestic wealth.

ments that are engaged primarily in leasing structures and/or equipment of particular types to specific industries or industry groupings. Industries of such firms could then be classed with their respective leasing industries. This would not work for firms renting out a wide variety of equipment; in this case a different approach to allocation of leased capital goods is discussed later.

It is recognized that the SIC must be revised occasionally—the Technical Committee on Standard Industrial Classification which advises the Bureau of the Budget recommends a revision every decade. It would be desirable if a revision or supplementary amendments are to be made, that they be undertaken prior to the beginning of the wealth inventory cycle, and with regard to its requirements to the extent that they are peculiar. For the sake of continuity in the statistics, revisions in classifications should not be undertaken unless there are compelling reasons. When they are made, the first subsequent collection should use both bases of classification in order to provide overlapping data for use in linking time series.

*The establishment basis.*—The establishment is not an ideal basis of reporting for purposes of production analysis, but it is probably the best practical basis available. Industries are defined in the SIC manual in terms of a range of activities (products) common to a number of establishments. The establishment is defined in terms of a single location. In addition to the primary products in terms of which an industry is defined, some or all of the establishments classed in that industry (because their outputs consist predominately of the primary products) may produce other secondary products. So not only are industries not coterminous with single products, but their outputs often go beyond a specific set of products. On average, establishments in the various four-digit manufacturing industries, for example, are about 90 percent “pure” with respect to the ratio of the value of primary to total products shipped.

Thus, technical relations within an industry, including capital coefficients, can appear to change (or differ among establishments) due to changes (or differences) in product mix. But instability due to mix is generally far less than would be the case if data were collected only for companies, many of the largest of which have establishments in several or many industries.

It would not seem feasible to try to associate tangible capital (or even labor) with particular outputs. This would work for production workers, materials, and possibly certain types of special purpose machines used only for a single product. But more or less arbitrary allocations of overhead capital (and nonproduction workers) to individual products would be required, and would probably not advance most types of production analyses as compared with analyses by industries defined in terms of groups of products.

The economic censuses for the several industries are based on establishment reporting. Firms in the regulated areas, however, report to the commissions on a company basis. Fortunately, major secondary activities and related assets are generally shown separately.

In the case of the Federal Government, real properties are reported in some detail to the General Services Administration on an installation basis (comparable to the establishment of private industry) while machinery, equipment, and inventories are reported in gross

categories to the Treasury Department on an agency basis. The recommendation of the working group that an inventory of "personality" be undertaken opens the way to using the installation basis of reporting for all tangible property. This would make possible a somewhat more refined classification of Federal general governmental activities and tangible assets by functions.

Not all data can be reported on an establishment basis in the case in multiestablishment firms. This is, of course, true of financial transactions and balance sheet data, since the firm is the financial decision-making unit. Books may be kept on gross tangible assets for establishments, by at least broad categories. With the adoption of group-depreciation methods in 1962, it is expected that asset-type detail and depreciation estimates will be readily available for a declining proportion of establishments. Pilot studies will be required to determine the extent to which tangible-asset detail can be collected from the books and/or underlying property records for establishments.

The establishment basis of reporting poses problems with respect to the treatment of central offices and auxiliaries which service several establishments. The census treatment, whereby they are omitted from three- and four-digit industry tabulations, but included at the two-digit level is a practical expedient. Certainly the collection agency cannot be expected to attempt to allocate the capital assets of overhead establishments among producing establishments. But the underlying data should be preserved and identified so that estimators could attempt an allocation if it seemed fruitful for their purposes. Such an allocation is hardly feasible in regional analysis, however.

*Leased assets.*—It is a practical necessity that asset data be collected from owners. Yet, for purposes of production analyses, it is the tangible assets *used* by an establishment which are related to its production. Because of the apparent increase in the practice of leasing machinery and equipment, as well as plant and other structures, the divergence between owned and used assets may be growing, as well as differing among industries. This highlights the need for collecting data required to adjust asset information from an ownership to a use basis. This means subtracting assets leased out from the total assets of certain industries, and adding assets leased into the assets of others.

The simplest means of making approximate adjustments would appear to be through collection of rental data in conjunction with asset data. For firms and/or establishments engaged in leasing assets out, the leased assets should be separately identified and reported by major types, and the gross rentals received likewise reported for the same asset classes. For establishments leasing assets in, gross rental paid should be reported for the corresponding major types. Ratios of asset values to rentals received could then be applied to rentals paid, by type, in order to accomplish a rough transfer of assets to a use basis. Refinements of this procedure should be considered in order to take account of varying rental bases depending on the extent of auxiliary service that is included in the leasing agreement. But the general approach appears to be sound. The census of manufactures already obtains data on rentals paid, but not in detail with respect to type of asset.

## ASSOCIATED CAPACITY AND OUTPUT DATA

Estimates of the percentage utilization of tangible capital assets would add to the uses to which wealth estimates could be put. Because of the problems, discussed below, of collecting the data necessary for the estimates, any program to obtain such data should be accomplished separately, and after the wealth data have been obtained, if it is necessary to establish priorities. Currently, various measures of percentage utilization are available, each based on a different conceptual framework. A description and appraisal of most of these can be found in "Measures of Productive Capacity," hearings before the Subcommittee on Economic Statistics of the Joint Economic Committee and in a study by Daniel Creamer for the Commission on Money and Credit which appears in "Inflation, Growth and Employment" (Prentice Hall, 1964).

In brief, current capacity measures range from a survey of capacity utilization conducted by McGraw-Hill, through the measures of Lawrence Klein and Daniel Creamer which are based on economic variables, to series assembled by the Federal Reserve Board which are based on engineering estimates. The variety of methods used reflects the fact that, to date, no suitable way has been found to frame questions on capacity and capacity utilization which can be answered in a meaningful and consistent manner through surveys or data analyses. A dynamic, operational definition of capacity is very difficult to frame.<sup>5</sup>

A discussion of the problems of defining capacity and some suggested questions for inclusion on the various questionnaires used to collect wealth data appear in a paper by Almarin Phillips which appears in appendix I, part G, of this report.

The methods employed by McGraw-Hill and Daniel Creamer could be substantially strengthened by benchmark data on wealth, accompanied by supplemental data collected on capacity. The McGraw-Hill survey asks the company each year for the rate at which it operated and the rate at which it would have preferred to operate. Undoubtedly, an aggregate company operating rate is difficult to determine, particularly for the large, multiproduct companies which comprise the McGraw-Hill survey. Those sectors in which operating rate estimates are more measurable and highly important, such as manufacturing, are surveyed by censuses on an establishment basis. The answers to the questions posed by McGraw-Hill could better be answered at the establishment level in conjunction with asset questions. Perhaps this could be accomplished soon for single product establishments where definitional problems are at a minimum. The capacity utilization estimates could be associated with the gross book value of the capital employed for the purposes of weighting the more aggregative utilization rates. In addition, much could be learned, through linking establishments with their parent companies, about the estimates obtained from the companies themselves by McGraw-Hill. Al-

<sup>5</sup> Even if the expensive task of finding the point of minimum average cost on the cost curve of each establishment were undertaken, the questions of the time periods would remain unanswered by this form of static analysis. The familiar questions of one, two, and three shifts, 5-, 6-, or 7-day workweek, are unanswerable other than by convention. User cost calculations would be required to make any advances along this line. At the other end of the scale, engineering estimates suffer from the same need to define the time period by convention and, in the case of multiproduct establishments, cannot be interpreted without supplementary economic data on relative product prices.

ternatively, company estimates could be obtained for benchmark years through the company plant and equipment survey of OBE-SEC. These estimates could be compared with the estimates of the component establishments collected by Census.<sup>6</sup>

If data on output, employment and other aspects of production could be collected along with asset and capacity data, consistency would be insured.

The Creamer method is based on the lowest fixed capital-output ratio in the benchmark or any subsequent year. As Creamer points out in the study referred to above, his capacity measure relies on the accuracy and consistency of the underlying capital and output series. Certainly, existing measures of capital stand to be greatly improved as a result of the recommendations for a wealth inventory contained in this report. Further, if accompanying capacity and actual output data are also gotten, a much improved benchmark becomes available for continuing estimates of the Creamer variety.

Consideration should also be given to identification of standby capacity in terms of capital equipment used chiefly to meet seasonal, cyclical, or erratic peaks in demand.

The purpose of the foregoing discussion has been to indicate how existing capacity measures can be improved through a wealth inventory, accompanied by questions designed to obtain relevant supplemental data. No attempt has been made here to suggest or evaluate new approaches to capacity and capacity utilization measures, except for those which appear in appendix I, part G, by Phillips. It is strongly recommended, however, that continued discussion in and out of Government be devoted to improving operational capacity definitions. The wealth inventory can be looked to as a source of better capital stock estimates which can be used in making capacity estimates.

#### TANGIBLE ASSET CLASSIFICATION

Most broad estimates of tangible wealth constructed to date have been highly aggregative with respect to asset-type detail. Where asset-type detail now exists, it generally consists of, at most, a breakdown into the following categories:

1. Land and natural resources.
2. Residential structures.
3. Nonresidential structures.
4. Producers durable goods.
5. Consumers durable goods.
6. Inventories (excluding those of households).
7. Net foreign claims.

Some wealth estimates for specific sectors provide some additional detail.<sup>7</sup>

Capital expenditures data exist in greater detail. OBE publishes quarterly or annual totals—part of gross national product estimates—

<sup>6</sup> The problem of aggregating establishment utilization indexes could be solved through the use of an input-output table. Such a table would serve to indicate bottlenecks in certain industries which would effectively limit the realizable output of some establishments within the economic framework. An alternative method of checking individual utilization rates against one important aspect of aggregate potential is to ask each establishment for the employment associated with full utilization of its capacity. Such data could serve many uses, such as providing a firmer basis for growth analysis.

<sup>7</sup> See stub from Goldsmith's study which appears in app. I, pt. B.

for 11 consumer durables categories, inventory change, 21 equipment categories (not published since 1954), and 25 residential and nonresidential construction classes. More detail is available at OBE, and at BDSA and the Census Bureau which supply OBE with basic data. For machinery and equipment, maximum detail is contained in the Census of Manufacturers. Volume II of the 1958 Census contains data on shipments by seven-digit product breakdowns. The dollar totals shown for each of these products are accompanied by physical-unit data when appropriate. Benchmarks for detailed time-series estimates of machinery and equipment expenditures can be constructed using these census data and annual survey data on product classes (five digit).

Asset-type detail has both analytical uses, and uses connected with the preparation of refined wealth estimates on a depreciated replacement cost basis. Analytical uses are enumerated in chapter 2 of this report. They include the analysis of market demand for specific types of tangible assets, general economic forecasting, and long-term projections.

Aside from these analytical uses, considerable asset-type detail for reproducible tangibles is of importance in constructing wealth estimates. The reflation of gross book values to replacement cost bases is greatly facilitated by a high degree of asset-type detail. Such detail would permit the reflation of each asset-type class by the price index relevant to it, rather than necessitate the use of gross price indexes to reflate a highly aggregated total. Thus, the investment in each type of assets, distributed over time, could be reflatd by a price index which would fully reflect changes in the prices of each asset-type. The greater the asset-type detail, the more refined are the resulting estimates, if comparable price index detail is available. This approach is implemented by OBE in its estimates of GNP in constant dollars, which are built up by deflating components, in finer detail than actually published, by relevant price indexes.

Asset-type detail is also useful in making the depreciation estimates necessary for net stock estimates. Each type of asset presumably has its own unique life-curve, reflecting the decline in its value over its useful life. Obviously, if asset-type detail is substantially lacking, depreciation can only be estimated using a composite life curve which would reduce the accuracy of the resulting estimates, theoretically, if not practically. Also, detail on rented assets and associated rentals, by type, are required to convert data from an ownership to a use basis.

One problem in obtaining asset-type detail is that some economic units maintain more detail than others in the same industry. This imposes the constraint that across-the-board asset-type detail cannot exceed that of the unit which has the least amount except by estimation. The importance of this constraint is reflected in part by the experience of IRS in its "Life of Depreciable Assets" study. This study was undertaken to assess the extent to which actual depreciation charges differed from those prescribed in 1942 in Bulletin F, for as many asset types as possible. The study was expected to provide a basis for the adoption of new depreciation guidelines. Originally, it was hoped that data on cost, by year of acquisition, could be obtained for about 200 asset classes, of which about 25 were used in any one industry. The primary data source for the LDA study was

schedule G of the U.S. corporation income tax return. When schedules were found to be 90 percent complete, the needed data were simply abstracted from the form. When the form was less than 90 percent complete, data were imputed where possible for firms with less than \$50 million of total assets. When the returns from larger firms were inadequate, IRS sought additional detail from the companies. Of the 557,000 returns sampled, data from 48 percent representing 72 percent of total depreciable assets, were unusable as reported on the tax forms. Furthermore, in spite of the cooperation of the companies upon reinterview by IRS representatives, the goals of the LDA were not fulfilled because of the lack of information. Too often, the respondents were unable to classify their assets and, as a result, the totals shown for miscellaneous accounts such as general industrial equipment are overstated. In other cases, classifications had to be collapsed because of the absence of the relevant breakdown in the records of the company.

The new depreciation guidelines adopted by the IRS may impose further, serious limitations on the potential availability of asset-type detail. For IRS purposes depreciation need be computed only for broad asset-type classes. Those which follow are relevant to the problem of obtaining detail useful for making wealth estimates:

- (1) Office furniture and fixtures.
- (2) Transportation equipment broken down into eight categories.
- (3) Land improvements.
- (4) Buildings broken down into 13 categories.
- (5) Agriculture broken down into machinery and equipment, four categories of animals, trees and vines, and farm buildings.

All other depreciable assets are broken down by industry of use rather than type.

Aside from detail on reproducible assets, analytical needs call for breakdowns of inventories and land. Manufacturers' inventories are currently broken down in four-digit industry detail, but inventory-type detail is limited to that on stage of fabrication—raw materials, goods in process, and finished goods. More information would be desirable on the composition of raw materials inventories. In the agricultural sector, there are estimates of the inventories of crops in storage, and livestock, though not of growing crops.

Aside from that of the Federal Government, detail on nonagricultural land by type is not available. Some data are available for certain regions as a result of land-use studies. There are many analytical uses to which a breakdown of land could be put. Such a breakdown, at a minimum, should show separately residential site land, nonresidential site land, productive land (broken down by resource), land under roads and streets, and vacant land.

The foregoing discussion implicitly underscores the important need for feasibility studies to determine (1) what degree of asset-type detail can be obtained across the board, from all or the most important using establishments, based on present accounts; and (2) the problems involved in getting extensive detail from underlying property records from a small sample of firms.

As stated earlier, asset-type detail is required both for the general purposes of economic analysis, such as demand studies, and for use in preparing the wealth estimates themselves. Most economic analysis



can be served by somewhat broader asset classes than those which would be desirable for constructing wealth estimates. For this latter purpose, since each type of asset has a unique life expectancy and has been purchased over time at varying prices, extensive detail could be used to advantage. Of course such detail would be useful, as well, for the economic analysis of specific markets.

Census 7-digit product classifications represent the greatest amount of detail currently collected on capital equipment. Perhaps, this level of classification, or the somewhat more aggregative Census 5-digit product classes, can serve as a basis of discussions with industry representatives as to what sort of wealth detail is appropriate for each industry. These classes can then be supplemented and collapsed where necessary, and the resulting classifications used as the basis for coding and collecting data on tangible assets.

The design of the collection effort can then be determined. Perhaps it might prove feasible to collect the broad totals on a basis similar to that used in the collection of data on asset and rental payments by the Census Bureau through its annual survey sample. More detailed breaks could be collected on a subsample basis, with inquiries specifically tailored to each of the responding industries. This differentiated-detail approach is used in the economic censuses and surveys. In view of existing recordkeeping practices of business, differing levels of detail will have to be collected at different levels of company organization.

For each of the two main purposes for which asset-type detail is important there are several guideposts which should be used to determine the actual detail collected. The detail obtained for use in constructing wealth estimates should reflect three objectives: First, asset-type detail should be sufficient to permit revaluation of stocks with price indexes which are not overly gross. Second, such detail should be sufficient to permit a unique depreciation rate to be applied to each important asset class. Third, such detail should be sufficient to permit the estimation of appropriate ratios required to prepare value estimates of leased assets.

For purposes of serving the needs of general economic analysis, four criteria applicable to asset-type detail should serve as guideposts. First, the detail should be sufficient for important analytical uses, actual and prospective. Second, where recommended by sector working groups, asset-type detail should be provided for broad categories which cut across industry lines, such as transportation and construction equipment. Third, detail should, where possible, tie into existing flow data such as those of OBE; it is suggested that any contemplated changes to flow accounts be made prior to the wealth inventory. Fourth, classes should be well defined and not so broad that all detail is biased, as occurred in the IRS study where the "general industrial equipment" class was overstated at the expense of other classes.

#### SUPPLEMENTAL PHYSICAL VOLUME DATA

Thus far, our discussion has presupposed the collection of value data by asset type. Some of the reports of the various working groups contain recommendations to obtain supplemental physical volume data for some items of tangible wealth. Many of these data are currently available (as indicated in the section reviewing existing data

in the reports) and others can be readily collected along with gross book-value data in a wealth inventory. Information on physical magnitudes increases the value of depreciated replacement cost estimates. These magnitudes are particularly useful in connection with market demand analysis and studies of long-term availabilities and requirements, such as those of the Office of Emergency Planning. No attempt will be made to evaluate the specific recommendations made by the working groups for physical-unit data, since they are familiar with the data needs of their sectors. Rather, the concern here will be with the usefulness of these data in preparing wealth estimates. It should be observed, however, that physical-unit data are not very useful unless they are collected by relatively homogeneous categories (which would be very numerous), or belong to categories with a relatively stable internal mix.

Physical unit data can provide part of the means of obtaining three types of information necessary for wealth estimates. These are (1) direct estimates of gross replacement cost, (2) data on the age-distribution of the physical units underlying the gross book-value totals, and (3) useful-life estimates for various types of plant and equipment.

Gross replacement cost estimates can be derived by multiplying current prices by the number of existing physical units. Examples of the use of this approach in projecting the costs of future projects are found in the reports of the working groups on Federal Government and service industry wealth. In the former the Department of Army calculates the cost of future construction by computing the average cost (per square foot, etc.) for various major categories of real property by type of construction. This per unit cost figure is then adjusted for regional cost differences, and multiplied by the number of physical units to be constructed. Similarly the figure of \$20,000 per bed is currently used by hospitals to estimate the cost of erecting new units or additions. This method can also be widely used in valuing land by type. If prices of used depreciable assets were available, physical units times average price for successive age groups could also be used to obtain market value estimates directly rather than through depreciation of replacement cost by year of acquisition.

As implied above, application of this method is limited since it cannot be extended to asset-type classes which comprise many different subgroups. Since the method is essentially akin to revaluation using market prices, it is obvious that the physical-unit data are useless for current-value estimates unless current prices or unit values are available, also. These limitations prevent the adoption of this technique as a general procedure for obtaining wealth estimates. However, estimates based on this method can be used in selected areas as a basis against which to check estimates derived by the methods discussed in chapter 7.

Where physical-unit data distributed by age are available, or can be obtained inexpensively, they can be useful in preparing wealth estimates in replacement cost dollars for asset classes for which the dollar value data, distributed by periods, are unobtainable. An example will elucidate this use. Assume firms report a gross book value of \$300 at the end of a wealth inventory year for a particular type of machine, of which they are the exclusive holders. Also, assume that a trade

group publishes the following physical inventory of these machines, distributed by their age as shown in column 1 of table I. With this information, the derivation of replacement cost estimates is shown in the remaining columns of the table.

TABLE 1.—*Revaluation of fixed reproducible tangible assets based on physical unit data*

	Number of machines	Price index (base year equals 3 years ago)	(1) by (2)	Percent of total	(4) by \$300	Price index (base year equals latest year) <sup>1</sup>	Replace- ment cost (5) divid- ed by (6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
New.....	3	120	360	14.4	\$43.2	100.0	\$43.2
1 year old.....	8	120	960	38.4	115.2	100.0	115.2
2 years old.....	8	110	880	35.2	105.6	91.7	115.2
3 years old.....	3	100	300	12.0	36.0	83.3	43.2
Total.....			2,500	100.0	300.0		316.8

<sup>1</sup> The price index used to derive the replacement cost figures is the same as that in column 2 except that the base year has changed. The question of whether a Laspayres or Paache index is appropriate for the revaluation is ignored here.

These age distributions of physical units have been developed primarily by trade groups and trade publication houses, for use in demand analyses and projections. Two notable examples of such data are those compiled by McGraw-Hill on metalworking equipment and published in *American Machinist & Metalworking Manufacturing* and those compiled by R. L. Polk & Co. on automobiles.

The American Machinist inventory of metalworking equipment is conducted every 5 years. Detailed breakdowns of 167 machinery and equipment types for 24 geographic areas and 44 using industries are given. Three age breaks are reported: (1) less than 10 years old; (2) 10 to 20 years old; and (3) over 20 years old. The first two age intervals probably are too wide to be usable for preparing wealth estimates and would need to be broken down further. For the 1963 inventory, questionnaires were sent to 34,000 metalworking plants from which 7,370 responses were received; the data were inflated to universe totals based on the ratio of employment of respondents to total employment for each industry.

R. L. Polk & Co. publishes annual data on automobile registrations by manufacturer. From these data, the age composition, by year, of the physical stock of automobiles can be seen. Such data would greatly facilitate the revaluation of the gross book value of automobiles to a replacement cost basis. The R. L. Polk data were also used by Charles Friedman of OBE in a study appearing in the September 1963 Survey of Current Business to draw up survivorship curves for automobiles. These curves are integral to length-of-life studies required as part of the process of estimating depreciation. Of course, the curves do not answer the questions of how the value of an asset declines over its lifetime.

## GEOGRAPHIC DETAIL

There is increasing interest in regional economic estimates and analysis, but no complete set of regional economic accounts has been developed. So far, OBE has provided only estimates of personal income by State, and is currently engaged in extending the personal income estimates to standard metropolitan statistical areas (SMSA's) and at a future date to countries which could be combined into other significant regional groupings.

The production account and associated tangible wealth estimates would seem peculiarly well suited to regional deconsolidation, owing to the establishment basis of much industry data. For the business sector composed of industries of companies in financial accounts, regional breaks would present major difficulties. But if an allocation procedure were used to distribute company financial assets by establishment, by region, the component establishment data would be needed on a regional basis. Hence, we discuss regional data in connection with the production approach.

In general, it seemed sensible to the working groups to try to obtain tangible wealth data for all States and at least the major SMSA's, where applicable, thus following the lead of OBE. For the broad data coming from economic censuses and other comprehensive sources, the county is generally used as the basic geographical unit. Types of wealth which are available on a State basis, but not by county, might be so distributed by interested analysts based on relevant criteria for which the more detailed data were available.

When a sample survey approach is used as the source for certain types of wealth data (such as household wealth other than housing and major durables), it would be expensive to have large enough samples to provide reasonably accurate State data. In this case, broader regional samples could be designed, and the blowup estimates allocated to States by interested users on the basis of correlated data which were available on a State basis.

Certain types of equipment, such as interstate transportation vehicles, do not have a fixed location. The Department of Defense does not supply geographic detail on military equipment. Only national totals would be shown for categories such as these, although users might attempt regional distributions of nonmilitary items, such as transportation equipment, based on related types of data for which State distributions were available.

## CHAPTER 5

### THE DESIGN OF NATIONAL BALANCE SHEETS AND FINANCIAL DATA COLLECTION

The emphasis in sector and national balance sheets is on what the units in the various sectors own, what they owe, and their resulting net worth. Tangible-asset values are included with the financial assets, of course, in order to arrive at the total value of assets and thus at net worth. But our emphasis in this discussion will be on the financial assets and liabilities, and the sectoring useful for financial analysis. In a final section of this chapter, we shall discuss the problems of linking the tangible asset data in balance sheets to the more detailed data obtained from industries of establishments discussed in the previous chapter.

#### THE SAVING-INVESTMENT ACCOUNT AND BALANCE SHEET APPROACH

The link between the national income and product accounts and sector balance sheets lies in deconsolidation of the saving-investment account. As now published by OBE, the saving-investment account is shown only for the Nation as a whole. At the level of the national economy, saving and investment are equal. OBE does show separately the income, outlay, and saving of selected sectors in appropriation accounts. But the explicit sectoring is not complete, and is not carried through the saving-investment account—which would require financial transactions data in addition to saving and tangible investment.<sup>1</sup>

John Gorman, of OBE, in appendix I, part F, shows how the present accounts could be adapted and elaborated to show sector saving-investment accounts, revaluations, and balance sheets in an integrated system. The numbers are hypothetical, and the sectors and types of transactions have been condensed to the basic ones needed to illustrate the structure of the interlocking accounts. After summarizing the basic structure as developed in the Gorman paper, we shall discuss in more detail the chief problems of sectoring and selection of types of financial assets and liabilities to be shown, based on the actual system of saving-investment accounts and partial balance sheets published regularly by the Federal Reserve Board. Reference will also be made to the complete set of national balance sheets, by sector, recently published by Raymond Goldsmith for the National Bureau of Economic Research.

Although the detail can be handled in alternative ways, the basic structure is relatively simple. The sector production accounts show the actual and imputed sales of each sector, and the associated costs

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<sup>1</sup> For a schematic representation of the present OBE national accounting system, see George Jaszi, "The Conceptual Basis of the Accounts," in "A Critique of the United States Income and Product Accounts," p. 37.

plus profit. As noted in the previous section, intersectoral purchases and sales cancel out upon consolidation, leaving the national income and product. Here, the sectoring is chosen with a view to illuminating the subsequent financial transactions and balance sheets. For production analysis, as described earlier, an industry sectoring within the predominant business sector is called for.

The appropriation accounts show as credits the income which the units in each sector receive from production, and from intersectoral income redistributions (transfer payments and taxes). Debits include current final expenditures, transfers, taxpayments, and saving as a residual.

The next account shows saving and investment on a deconsolidated basis by sector as well as consolidated for the Nation. As is well known, on the consolidated national basis (as now published by OBE), saving and investment (domestic plus net foreign) are equal. But when deconsolidated, the saving and tangible investment of each sector are unequal, the difference representing "net financial investment" to use the FRB term, which is the difference between the net acquisition of financial assets and the net increase in liabilities. But there is equality for each sector, as shown in Gorman's table 4, between total investment, tangible plus financial, and total saving plus borrowing. It would be feasible to split the saving-investment account to show tangible and financial components separately, as the Canadians do. Other rearrangements of activity accounts are possible, but the underlying logic is the same.<sup>2</sup>

The changes in all assets and liabilities of the saving-investment account are one of two sets of estimates needed to explain the differences in sector and national balance sheets, expressed in current values, between the end of two successive periods. The other set of estimates needed is a "valuation statement" showing the changes in the values of assets and liabilities held on both dates or acquired in the interim. Increases in value due to price rises are debited to this account, while decreases due to price declines or to depreciation of fixed assets (and other capital consumption) are credited. Then, to the beginning assets of the balance sheet are added net valuation changes plus tangible and financial investments during the period, while net borrowing is added to liabilities. The change in net worth is the result of the net investment plus the net valuation change. When the sector balance sheets are consolidated, according to Gorman's scheme, the national balance sheet shows the value of tangible assets (as the sum of values of assets taken separately), net claims on foreigners, and the excess of the value of firms as going concerns over the sum of the value of individual tangibles.

The currently published FRB flow of funds accounts start with gross saving, gross private domestic investment (tangibles, including consumer durable goods), and net financial investment, arrayed by 11 main sectors. Then, in the subaccount of prime interest to the FRB, net changes in financial assets and liabilities are shown for 20 types of financial instruments.

The FRB also publishes partial balance sheets, showing the amounts of financial assets and liabilities outstanding, by the same categories,

<sup>2</sup> See especially "The Flow of Funds Approach to Social Accounting," pt. I.

as of the end of each period. Except for corporation stock which is valued at market, the assets and liabilities are valued at book so that the flows equal the changes in amounts outstanding (and, indeed, are often so derived).<sup>3</sup>

Complete national balance sheets in current dollars have recently been prepared by Goldsmith, Lipsey, and Mendelson for the National Bureau of Economic Research revising and updating to 1958 earlier estimates by the senior author contained in "A Study of Saving in the United States."<sup>4</sup> His summary balance sheet for the end of 1958 is reproduced in table 2. It shows 2 dozen types of intangible assets as well as tangibles in 6 categories, and equities in addition to liabilities in 13 classes, for 7 major sectors and a combined (but not consolidated) national total. The 1958 summary indicates the relative importance of the various sectors and types of claims, and helps make more concrete the subsequent discussion of structure.

In his recent volumes, in addition to presenting national balance sheets, by years 1945-58, Goldsmith also presents sector balance sheets, by type of claim, for the selected years 1900, 1912, 1922, 1933, 1939, and 1945-58 annually; and also type of claim tables, by sector, for the same years. He further shows the corresponding flow of funds tables annually 1946-58, including detail for 13 financial subsectors.

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<sup>3</sup> The FRB partial balance sheet is shown and described in the Federal Reserve Bulletin for August 1959 in the article "A Quarterly Presentation of Flow of Funds, Saving, and Investment," table 6.

<sup>4</sup> Raymond W. Goldsmith and Robert E. Lipsey, "Studies in the National Balance Sheet of the United States," I, Princeton, 1963.

Raymond W. Goldsmith, Robert E. Lipsey, and Morris Mendelson, "Studies in the National Balance Sheet of the United States," II, Princeton, 1963.

TABLE 2.—National balance sheet, 1958

[Billion dollars]

	Nonfarm households	Nonfarm unincorporated business	Agriculture	Nonfinancial corporations	Finance	State and local governments	Federal Government	Total
<b>I. Tangible assets:</b>								
1. Residential structures.....	346.81	16.26	19.28	21.31	0.64	6.03	1.01	411.34
2. Nonresidential structures.....	26.26	25.56	16.75	180.83	4.78	133.20	35.00	422.38
3. Land.....	92.16	22.74	87.58	63.46	4.04	28.00	12.80	310.78
4. Producer durables.....	2.07	26.94	18.59	145.53	.85	5.25	.61	199.84
5. Consumer durables.....	164.73		14.02					178.75
6. Inventories.....		16.81	26.15	78.81	.03	.20	7.89	129.89
7. Total.....	632.03	108.31	182.37	489.94	10.34	172.68	57.31	1,652.98
<b>II. Intangible assets:</b>								
1. Currency and demand deposits.....	61.36	13.46	6.20	33.34	92.59	10.78	41.9	221.02
(a) Monetary metals.....	1.62	.27	.25	.21	23.06			25.41
(b) Other.....	59.74	13.19	5.95	33.13	69.53	10.78	4.19	196.51
2. Other bank deposits and shares.....	140.56		3.07	1.60	1.08	3.58	.33	150.22
3. Life insurance reserves, private.....	99.70		6.71					106.41
4. Pension and retirement funds, private.....	27.80							27.80
5. Pension and insurance funds, government.....	65.67		.43					66.10
6. Consumer credit.....		4.70		8.21	33.19			46.10
7. Trade credit.....		11.64		83.37	3.64		1.70	100.35
8. Loans on securities.....					9.23			9.23
9. Bank loans, n.e.c.....					53.80			53.80
10. Other loans.....	3.10				9.42		19.05	31.57
1. Mortgages, nonfarm.....	22.72				131.22	1.61	5.10	160.65
(a) Residential.....	12.79				113.52	1.61	5.10	133.02
(b) Nonresidential.....	9.93				17.70			27.63
2. Mortgages, farm.....	4.54				4.26		2.46	11.26
13. Securities, U.S. Government.....	58.57		5.21	17.62	176.01	11.08	5.82	274.31
(a) Short term.....	3.16			15.20	41.63	6.00		65.99
(b) Savings bonds.....	43.02		5.21	1.22	2.43			51.88
(c) Other long term.....	12.39			1.20	131.95	5.08	5.82	156.44
14. Securities, State and local.....	24.79			1.63	31.23	2.44	.97	61.06
15. Securities, other bonds and notes.....	11.12			2.68	74.30	.67		88.77
16. Securities, preferred stock.....	10.37			3.55	4.36			18.28
17. Securities, common stock.....	332.62			75.45	39.10			447.17
18. Equity in mutual financial organizations.....	8.04							8.04
19. Equity in other business.....	98.24						.42	98.66
20. Other intangible assets.....	.62		3.81	48.14	29.78		18.28	100.63
21. Total.....	969.82	29.80	25.43	275.59	693.21	30.16	58.32	2,082.33



III. Liabilities:									
1. Currency and demand deposits.....						223.18		2.60	225.78
2. Other bank deposits and shares.....						151.62		1.22	152.84
3. Life insurance reserves, private.....						108.51			108.51
4. Pension and retirement funds, private.....						27.80			27.80
5. Pension and insurance funds, government.....						66.10			66.10
6. Consumer debt.....	44.77		1.33						46.10
7. Trade debt.....	1.83	9.00	2.30	68.78		.21	2.00	2.83	86.95
8. Loans on securities.....	6.20					3.42			9.62
9. Bank loans, n.e.c.....	2.12	12.45	4.16	25.94		5.69		.81	51.17
10. Other loans.....	4.37	5.42	1.87	2.18		5.55			19.39
11. Mortgages.....	117.05	13.94	11.25	29.67					171.91
12. Bonds and notes.....				69.68		9.09	61.16	288.49	428.42
13. Other liabilities.....				60.84		31.20		1.80	93.84
14. Total.....	176.34	40.81	20.91	257.09		632.37	63.16	297.75	1,488.43
IV. Equities.....	1,425.51	97.30	186.89	508.44		71.18	139.68	182.12	2,246.88
V. Total assets or liabilities and equities.....	1,601.85	138.11	207.80	765.53		703.55	202.84	115.63	3,735.31

Source: Raymond W. Goldsmith, Robert E. Lipsey, and Morris Mendelson, "Studies in the National Balance Sheet of the United State," II, Princeton, 1963, pp. 68-69.

Any discussion of national balance sheet structure must take account of both the FRB and NBER (Goldsmith) work, as well as possible improvements in both. In the introduction to volume II of his recent study, Goldsmith gives a detailed comparison of his sectors and categories with those of FRB, together with reconciliations of some of the estimates for recent years. In what follows, we shall point out major differences and possible alternatives.

### SECTORING

There is no single general principle or set of criteria which may be relied on in distinguishing economic sectors for which separate transaction accounts should be set up. Since the main purpose of sectoring is to facilitate economic analysis, a major aim must be to group together transactors who behave similarly, have similar transaction and balance sheet structure, and react similarly to given financial or other stimuli. Although terminology is somewhat ambiguous, it has been stated that sectoring is primarily institutional, while the several activity accounts separate the chief functions of the sectors. In general, it is considered desirable to include all the transactions of the units grouped together as a sector, rather than to split them. But in some instances, it may facilitate analysis to show units behaving in different functional capacities in different sectors—as proprietors in their personal and business capacities, or the governmental monetary authorities which the FRB removes from the government sector and places with private financial institutions.

Other considerations, such as data availabilities and the desire for statistical continuity, affect sectoring decisions and may make some of them appear to be arbitrary. But any classificatory system is likely to involve more or less arbitrary decisions in application. In what follows, we shall discuss the broad features of the sectoring now in use, rather than the treatment of detail.

### THE GENERAL SYSTEMS

The OBE national income and product accounts are really not yet sectored for purposes of full saving-investment and balance sheet analysis. Appropriation (income and outlay) accounts are currently maintained for persons (including persons in their capacity as proprietors), governments, and foreigners (which is, strictly speaking, not a sector but an external account). The appropriation accounts for nonfinancial corporations and financial intermediaries are consolidated into the production account. In his hypothetical deconsolidation, Gorman sets up sectors for proprietors, other persons, nonfinancial corporations, financial intermediaries, government, and foreigners.

This approaches the sectoring used by the FRB and NBER. The FRB consumers sector relates to all households (and nonprofit institutions), while NBER's relates to nonfarm households. They both have three nonfinancial business sectors: farming (including farm households in the case of NBER), nonfarm noncorporate business, and corporations. They both have a finance sector, although FRB includes a fourfold breakdown in the summary tables (and additional breaks in subsidiary tables, while all of the NBER breaks are subsidiary); they both have two government sectors, Federal, and State and local; while only the FRB shows a rest-of-the-world account.

## THE HOUSEHOLD OR CONSUMER SECTOR

In Goldsmith's view, it would be desirable to confine the household sector to units which are homogeneous in the sense that their motivations are primarily those of consumers. There are three chief problems from this viewpoint in both his (NBER) and the FRB accounts, as well as in the OBE "personal" account, which should be corrected.

(1) The household accounts include nonprofit institutions, due to insufficient data to effectuate the setting up of a separate sector in the interests of conceptual clarity. The Working Group on the Service Industries strongly recommends the expansion of existing reporting systems to provide benchmark data on the tangible assets and financial claims of the nonprofit institutions. Goldsmith notes that the tangibles can be extrapolated currently by the perpetual inventory method, although improvement of current reporting of financial transactions of this sector would still be needed.

(2) Personal trust funds are included in the household sector due to lack of adequate current data to make it possible to set these up in a separate subgroup of the finance sector. The latter treatment would require the addition of another type of financial claim in the household sector—investment or equity in personal trusts—which would become a liability of the new sector. The Working Group on Nonfarm Business Financial Claims recommends obtaining data on personal trusts from the banks rather than from households.

(3) There are difficult problems involved in separating the business activities and associated balance sheets of proprietors from their finances as consumers. Both NBER and the FRB attempt a segregation which seems desirable for analytical purposes. Goldsmith, however, in line with present Department of Agriculture practice, keeps the household and business aspects of farming together in a separate sector. The FRB, on the other hand, attempts an allocation of farm assets and liabilities between household and business use. It is noteworthy that the Working Group on Agricultural Wealth, which included several representatives of the Department, recommended a separation. (See app. II, pt. E, for the details of their recommendations on this point.) They advocated that farm subsectors be maintained in both the household and nonfinancial business sectors, however, so that for some analytical purposes a "farm sector" could be reconstituted.

With respect to nonfarm households, both NBER and the FRB have consumer activities of proprietors in the household sector, their business activities in the nonfinancial noncorporate business sector with income and investment flows between the two sectors. Where possible, they separate business assets and liabilities clearly identifiable as such, put most of the remainder in households, and split only a few predominantly joint-use items, such as demand deposits if the proprietor does not maintain a separate business account, using rough allocation criteria. A main difference between the two treatments is that the FRB puts mortgage debt on rented one- to four-family houses as liabilities of unincorporated nonfinancial business, while Goldsmith treats them as investments of the household rather than as a business activity primarily.

In general, since the household sector consists of almost 60 million units, most analysts have pointed to the desirability of providing some subsectors—at least on an occasional basis. Of particular relevance to the focus of interest of this study are proposals to sector according to size-classes of asset holdings. As is pointed out in appendix II, part C, all assets, tangible and financial, should be taken into account. Such a survey remains to be made.

Up to this time, financial items in balance sheets of households have been derived largely as residuals. This underscores the need for a comprehensive household survey, as proposed by the Working Group on Household Wealth, although checks against institutional records are still needed. The value of a household asset survey is enhanced when the asset data are obtained in conjunction with income and other characteristics of households with which they can be cross-classified. Even the perpetual inventory approach requires benchmark wealth data, particularly for the minor durables.

#### NONFINANCIAL BUSINESS

Both NBER and FRB split the nonfinancial business sector 3 ways—nonfarm corporations, noncorporate business, and farming which comprises both unincorporated enterprises and the few corporations that operate in the industry (and NBER includes farm households with the enterprises). The distinction between corporate and noncorporate enterprise based on legal form is not necessarily the most useful—other subsectors such as asset-size groups, or broad industry groups (discussed below) may be more so.

The treatment by Goldsmith of the corporate business sector is very similar to that of the FRB from which he drew most of his estimates for the postwar period. He includes real estate corporations, which had been classed in the finance sector in his earlier "Study of Saving," and excludes financial and agricultural corporations. The main difference with the FRB is that the Board consolidates corporate balance sheets, netting out most corporate assets with the major exception of trade credit. This virtually removes holding companies and closed-end investment companies from the FRB account, as well as several type-of-claim categories.

Since the basic data come from "Statistics of Income," in which corporate balance sheets are on a consolidated basis, there may be some overlap with the finance sector. Activities of pension, welfare, and profitsharing plans established by corporations are excluded from this sector to the extent they can be identified.

Noncorporate businesses, which fall predominantly in trade, construction, and the services, include mutual organizations, agricultural cooperatives except those in farm credit, and nonprofit organizations, such as trade associations serving business. When a nonprofit institutions sector is created, the latter should be classed as one of its subgroups. Otherwise, the noncorporate sector includes all private assets and liabilities that are not clearly corporate or household, except that a few commingled items are split with the latter sector as noted earlier. Next to the household sector, data for unincorporated businesses are the weakest.

From the standpoint of consistency, the farm sector should be broken down between corporate and noncorporate. For purposes of analysis, however, it would probably not make much difference in national estimates.

The chief recommendation of the Nonfarm Business Financial Claims Group with respect to sectoring is that data be collected for balance sheets by broad industry groupings. Flow of funds and balance sheet estimates by broad industry groups are needed to study typical purchase decisions, financing requirements and patterns, and liquidity needs, as background for more refined economic analysis and policy decisions particularly in the monetary field.

Due to the skewness of the distribution of financial assets—much more is held by financial companies than nonfinancial—a much broader grouping of industries is indicated in the latter sector. Further, in view of the industry-heterogeneity of multiestablishment nonfinancial companies, the broad groupings are generally much more meaningful than the narrower ones for general purpose analysis. Since the company is the financial decisionmaking unit, this must be the basic unit for industry combinations. Businesses would probably have to be permitted to consolidate their subsidiaries in their reports as is advantageous for tax purposes, although the financial claims group would prefer a standardized basis of consolidation at the 50-percent ownership level for domestic subsidiaries.

The recommended industry subsectoring is shown in exhibit C of appendix II, part O. In general, it comprises two-digit SIC industries, or combinations thereof. In a few cases outside finance, three- or four-digit industries or combination thereof are recommended. In all, 54 private nonfinancial industries are distinguished. These generally conform to industry groupings shown in the new Standard Enterprise Classification, but with less detail and some different combinations. In a few cases, however, groups are formed from portions of SIC industries, while the Standard Enterprise Classification combines only entire SIC industries. For some special purpose analyses greater detail may be desired than the group recommends. When greater detail is to be obtained, the group points out that companies should be classified "from left to right." (See app. II, pt. O.) After balance sheet data have been tabulated by industry, examination of the financial patterns may suggest some different arrangements, of course.

Subsectoring by company asset-size classes is another possibility the group advocates, but with class limits varying from one industry to another. This would throw light on the financial problems of small business and indicate differing patterns of concentration by industry. A sectoring by geographical regions is not generally advocated for purposes of balance sheet analyses, although in industries where single establishment firms prevail, as in agriculture, regional sectoring would have meaning.

#### FINANCIAL BUSINESS

The finance sector, as defined by both NBER and the FRB (with a few differences to be noted later) includes not only those institutions whose liabilities are regarded as money or near money (a possibly

narrow definition) but all institutions whose assets consists primarily of intangibles other than securities of subsidiaries and affiliates, and whose primary business is to act as intermediary between ultimate lenders and borrowers.<sup>5</sup> The groupings of subsectors used by the FRB are presented below, as a basis for further discussion.

Commercial banks and monetary authorities:

Commercial banks (United States).

Monetary authorities (consolidated account for the Federal Reserve System, ESF, and Treasury currency accounts).

Savings institutions:

Mutual savings banks.

Savings and loan associations.

Credit unions.

Insurance:

Life insurance.

Noninsured pension plans.

Other insurance companies.

Finance, n.e.c.:

Finance companies.

Security brokers and dealers.

Investment companies, open end.

Agencies of foreign banks.

Banks in U.S. possessions.

Other.

The NBER, in subsidiary tables, shows much the same groupings, except that fire and casualty companies are separated from "other insurance companies," and several of the "finance, n.e.c.," subgroups are merged. The NBER includes agricultural credit organizations in "finance, n.e.c.," whereas NBER also covers closed-end and face-amount investment companies in addition to open-end investment companies. Finally, NBER has a separate subsector for Government pension and insurance funds, which the FRB keeps in the Federal, and State and local government sectors. The FRB procedure is preferred by the Wealth Study working groups in both the financial claims and government areas.

The Working Group on Nonfarm Business Financial Claims would have data collected to make possible balance sheet estimates for still finer industrial subdivisions of the finance sector. (See app. II, pt. O, exhibit C.) In essence, relative to the present FRB subsectors, the group would break down the "finance companies" category into consumer finance companies, sales finance companies, mortgage companies, commercial finance companies, and miscellaneous. Like NBER, they would show "other investment companies" in addition to open-end management investment companies.

Finally, the working group would set up an additional sector for personal trusts. This accords with the view of the Household Group.

<sup>5</sup> See Goldsmith and Lipsey, *op. cit.*, p. 32. The definition is somewhat less inclusive than used by Goldsmith in his volume "Financial Intermediaries."

## GOVERNMENTS

The NBER and FRB treatments of the State and local governments are virtually the same. The sector contains all the general government and enterprise activity of States and the District of Columbia, cities, counties, special districts and authorities, and other local government units. These governments' own trust and sinking funds are included, but NBER had shifted the employee pension and retirement funds to the finance sector. The sector account is a combined statement of consolidated accounts for individual government units, although the consolidation is not complete with respect to debt and interest transactions between government units and their own trust and sinking funds.

The Federal Government sector includes all legally owned and/or controlled activities except for the monetary authorities. It covers all the departments, other agencies and trust funds (with exceptions noted), all corporations, credit agencies, and other enterprises, as well as Federal land banks and home loan banks even though these banks have passed into private ownership.

The Treasury monetary funds and the Federal Reserve System banks are shifted to the banking subsector of the finance sector. NBER, but not the FRB, separates out Federal pension funds. The FRB also does not treat OASI and unemployment trust fund assets as a Federal Government liability to the household sector. NBER has supplementary tables for the postal savings system, lending and credit agencies, and the Federal land banks. While excluded from the balance sheet, NBER also presents estimates of the value of military equipment and structures and Atomic Energy Commission assets, in order to make possible alternative estimates of total national assets including military.

It has been advocated by the working groups, and by others, that enterprise subsectors be set up, with a separate account for financial activities, and possibly other divisions.<sup>6</sup> Before this is done, however, it would be desirable if the statistical agencies in the national economic accounting field first reconsidered the boundaries between general government and Government enterprises, and possible divisions within these groupings, with particular respect to differing patterns and criteria of decisionmaking.

It would, of course, be possible to allocate the various governmental enterprises to the appropriate industry groupings of the business sector. But as Goldsmith has pointed out, this treatment "would run counter to the principle that assets and liabilities under the control of one decisionmaking unit should be kept together."<sup>7</sup> By the same argument, it is desirable that the monetary authorities be kept in a separate sector, as is done by the FRB, so that it can be recombined with the Federal Government sector for certain analytical purposes, as recommended by the Working Group on Federal Government **Wealth.**

It is also feasible to separate State governments from local governmental units. While some more or less arbitrary allocations would be

<sup>6</sup> See Stanley J. Sigel, "An Approach to the Integration of Income and Product and Flow of Funds National Accounting Systems," "The Flow of Funds Approach to Social Accounting," p. 25.

<sup>7</sup> Goldsmith and Lipsey, op. cit., p. 33.

required, size and diversity of the sector is such that a breakdown would be desirable. Considerable additional work is required, but progress in this direction has been made at the Office of Business Economics.

#### TYPES OF FINANCIAL ASSETS AND LIABILITIES

The objectives of asset-type detail are to present totals for important types of instruments, minimize the size of "all others" categories, provide data on maturity classes necessary for liquidity analysis and allow for cross-classification of instruments by major economic sectors.

The importance of each instrument will, of course, vary from sector to sector. This raises the question of whether or not the detail obtained from each sector should vary as well. If the surveys conducted in each sector are designed to vary with respect to detail, it is obvious that a full matrix of claims, by type and by sector, cannot be constructed without interpolation. This procedure, however, is currently employed in filling some cells in the flow of funds matrix. It is clear that this will have to be done in a financial claims inventory as well, since to ask for information in the same detail in all sectors would involve costs too high in relation to the usefulness of the data.

An important aspect of the asset-type classes recommended by the Nonfarm Business Financial Claims Working Group is the emphasis on detail concerning the liquidity of the various instruments. For relevant asset and liability classes suggested line items serve to distinguish among claims with original maturities of 1 year or less, claims with longer maturities on which installments are due no more than 1 year from the balance sheet date, and claims due in more than 1 year.

#### BALANCE SHEET ASSET ITEMS

While each of the sector balance sheets will differ in detail, there are certain common elements which will appear in each. These are discussed next and major exceptions applicable to specific sectors are noted.

Cash should be separated from deposits wherever possible so that the total for deposits in financial institutions is clean. Deposits should be broken down into demand and time, with a further breakdown of the latter by financial institution where appropriate.

Securities of central governments should be shown separately from issues of governmental agencies. Separate totals should be obtained for holdings of State and local government securities. The liquidity classes referred to above should be used for all governmental issues whenever appropriate.

Notes and accounts receivable should be broken down into current and noncurrent. However, all credit advanced to consumers by non-financial business should be regarded as current, which is the approach now used.

Some detail, designed to meet the needs of each sector, should be obtained for other short-term securities such as commercial paper and bankers acceptances.

The "other current asset category" should be analyzed and major components isolated. Prepaid insurance premiums are known to be an important item which should be shown separately.



Noncurrent assets should be presented in substantially more detail than is done currently. Investment in nonconsolidated subsidiaries should be shown at book value in the balance sheet. In a memo entry, the respondent should be asked to state the parent company's equity in its subsidiaries, if this differs from the value at which the subsidiaries, are carried on the books.

Holdings of long-term securities, other than those of nonconsolidated subsidiaries, should be broken down further. Stocks, bonds, mortgages, and "all others" would be generally appropriate. Stocks could be divided further into those publicly traded and those for which there are no public markets. For the former category, market values could be obtained.

In addition to the data on investment in nonconsolidated subsidiaries and long-term securities, the noncurrent category should also include totals for deferred charges, goodwill, and the noncurrent receivables item mentioned above.

The remaining entry on the proposed balance sheet would be the plant and equipment account aggregate. The use of the total as a control has been discussed earlier in connection with tangibles assets.

#### LIABILITIES AND EQUITY

On the liability side, short-term borrowings from banks, governments, suppliers (broken down into credit from subsidiaries and affiliates, and others) finance companies, officers or stockholders, the open market, and others, are the general categories which are widely appropriate. Deposits, CCC loans, life insurance and consumer debt, for banks, farmers, insurance companies, and households, respectively, are examples of specialized accounts which must be provided for certain sectors.

Aside from installments due within 1 year on long-term debt, the remaining categories of current liabilities which will have widespread application are accrued Federal income taxes, dividends payable, and accrued payrolls.

The major categories of long-term liabilities are mortgages, term loans from banks, bonds, notes, and debentures, and other long-term loans. Mortgages should be broken down into those obtained from commercial banks, insurance companies, other financial institutions, and "all others." Subtotals for both publicly offered and privately placed bonds, notes, and debentures would be useful. Other long-term loans should be divided into those placed with financial institutions, officers and stockholders, and others.

The liabilities of uninsured pension funds and the corresponding assets of the beneficiaries deserve special mention. The potential liabilities of the social security system, for example, are considered by most to be in excess of the net asset value of the fund available for distribution. Thus, if households were to include their potential claims as assets, the balance sheets of the fund would have to be adjusted to show a deficit, which would be a special liability item. Rather than do that, it seems appropriate to carry the claims of beneficiaries as an asset, the value of which does not exceed the net asset value of the fund. An alternative approach is to omit them entirely and net the holdings of the system against outstanding Federal debt.

This would increase the consistency in the householders' equity accounts and facilitate the analysis of household wealth by size-class.

Equity or net worth is the remaining balance sheet entry. For non-financial corporations, this should be divided into three categories: (1) Reserves not elsewhere reflected; (2) preferred stock; and (3) common stock, capital surplus, and earned surplus. For certain financial corporations more detail is appropriate.

The foregoing balance sheet items only can be viewed as tentative. Final determination of the categories must be delayed until the inventory year approaches because of the continual changes in the composition of claims. The recent rise in the importance of savings accounts at savings and loan institutions and Euro-dollars are familiar examples of the recent changes of this nature.

While there are many data available on financial claims, gaps still remain. The sectoring of many types of claims is done by methods which could be vastly improved if better data were available. For some series, benchmarks need updating. The recommendation that balance sheets be collected for both the beginning and end of the survey year will provide new benchmarks for flow of funds analysis.

#### LINKAGE BETWEEN INDUSTRY WEALTH AND SECTOR BALANCE SHEET APPROACHES

The divergence between wealth data on a producing-industry basis and on a decisionmaking sector basis arises chiefly with respect to the industry divisions of the nonfarm business sector. The government sectors are largely self-contained in both approaches, although the "monetary authorities" subsector would have to be recombined with Federal Government for some analytical purposes. Whereas the FRB keeps the public corporations and other enterprises within the Government sectors, it would seem desirable to class these by industry, so that for some purposes of production analysis they could be combined with the corresponding private industry groups. Perhaps the chief adjustment required for production analysis is to shift out the tangible assets leased to private industries, and to bring in those which are leased from private industry. Both government working groups recommended the estimation of wealth on both ownership and use basis, with separate enterprise subsectors.

The household sector has been viewed as a consuming sector (although basically it produces services and processes goods for its own use). Households are also listed as a service industry by the SIC to take account of the wages and salaries it pays, largely for domestic servants. It would hardly seem useful, however, to attempt to segregate that part of household wealth used by domestic servants. It would seem useful to estimate the value of the goods leased by households from private industry, as recommended by the Working Group on Household Wealth.

Aside from the leasing problem, virtually all of the tangible wealth owned in the government and household sectors, and carried on their balance sheets, are used in those sectors as defined. This is not true of almost half of the multiestablishment companies. Of the 91,000 multi-establishment firms covered in the 1958 economic censuses, 41,000 had establishments engaged in more than one of the 855 different Census

four-digit industries. This is not a large proportion of the 3.2 million firms covered, but they account for over 44 percent of all the employees reported, and probably a larger percent of assets.

As a result, IRS (and FTC-SEC) industry data in which whole companies are classified by industry do not match industry totals built up from Census establishment data. For certain purposes, it would be highly desirable to have a link between the company and establishment reports—showing a summary of Census data for the establishments of matched IRS corporations, classified by IRS industry, with separate data for all establishments of the matched corporations by four-digit industry. This information would, first of all, have an important use in revaluing book data on depreciable assets to current value. The reflators developed for Census industries could be appropriately weighted in order to obtain a composite reflator for the book value of depreciable assets by IRS industry. Beyond this, the distributions make it possible to allocate data gotten by IRS, but not by Census (primarily financial data), to Census industries. This would also make possible geographical distributions of IRS data by location of the productive activities. Whether or not distributions by industry of company financial data according to relationships between common items in the two bodies of data are sufficiently meaningful would have to be judged by the analyst in the light of his objectives.

Just such a link has been provided by the Census Bureau as part of the 1958 enterprise statistics program. In addition to summarizing Census data for matched corporations, classified by IRS industry and distributed by four-digit industry, the Bureau also indicated the portion of the corporate universe in each IRS industry that was successfully matched with Census records in terms of number of enterprises, business receipts, net income, inventories, and total assets. Of the 3,600 IRS tax transcripts falling within the industrial scope of the 1958 censuses, 3,300 were considered to be successfully matched to their equivalent organizations in 2,700 Census companies. Census companies are defined to include all subsidiary corporations under the ownership or control of a parent corporation, which is also the definition of Moody's and the FTC-SEC survey, while many complex companies report to IRS on a deconsolidated basis due to tax considerations.

Complete matching did not prove feasible in part because of these differences in definition of organizational units. Even when a company reported on a consolidated basis to IRS, there was no separate identification of subsidiaries engaged in foreign operations, which are statistically significant in some industries. Matching was also made difficult by differences in industry classifications assigned by each agency to the same corporation. Whereas Census is able to classify each corporation by four-digit industry codes of its constituent establishments, IRS coding of companies is based on their own description of principal business activity, supplemented by some outside evidence. Differences are significant at the three-digit level. Matching was also complicated by the fact that more than 40 percent of companies failed to report their social security employer identification numbers to IRS, although requested to do so on form 1120. The EI number is the central means of identification by Census; hence, it was necessary to determine the appropriate missing EI number associated with each IRS transcript. Mr. Murray D. Dessel of the Census Bureau believes

that with the complete computerization of the IRS income-tax-return processing system, many of the informational gaps referred to could disappear before the end of the decade.<sup>8</sup>

Actually, the 3,300 successfully matched corporations accounted for almost half of the \$575 billion corporate business receipts of all Census-covered industries. In addition, by indirect estimation techniques, it was possible to match implicitly the Census and IRS business receipts of all other single-industry corporations, thereby increasing the matched coverage to 89 percent.

It is evident that the 1958 Census-IRS match covered a large enough portion of the corporate universe involved to provide a useful link between establishment and company data. With the increased coverage likely by 1968, it would be most helpful for purposes of wealth and balance sheet estimation and analysis for the Census-IRS link project to be repeated regularly, at least quinquennially at the time of the economic censuses into which extensive asset data should be tied.

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<sup>8</sup> See Murray D. Dessel, "Statistical Problems in Measurement of Real Wealth in the Business Sector," 1963 "Proceedings of the Business and Economic Statistics Section," American Statistical Association, pp. 280-300. Much of this section was based on Mr. Dessel's paper.

## CHAPTER 6

### VALUATION—GENERAL APPROACHES

The valuation of tangible assets poses some of the most difficult problems that must be faced in planning for a wealth inventory. The difficulty stems from the fact that assets are carried on the books and/or records of most firms and other organizational units at cost. Since assets were acquired at different dates, their valuation has no uniformity. For purposes of wealth estimates, market or other present values are desired. Unfortunately, it is not feasible to ask owners to estimate and report the present value of the bulk of their tangible assets. The estimating agency is, therefore, confronted with the problem of collecting book values and using associated or collateral data to adjust them to estimated market values.

In the first section of this chapter, we shall discuss valuation generally—the deficiencies of book values, the limited scope of direct market price data for assets, and the several possible proxies. In the second section, valuation problems are reviewed for each of the major classes of tangible assets, and for financial claims.

#### BOOK VALUES

Economists are in substantial agreement that estimates of wealth in terms of book value, or original cost, are not as meaningful as market or other present-value estimates. If general and/or relative prices have changed significantly over time, original costs lose their meaning. Except for short-lived or recently purchased goods, original costs represent neither the present values of projected net income from the use of the wealth, nor the replacement costs of the man-made capital. Since the age-distribution of assets differs among firms and sectors, book values are not fully comparable. Nor are they comparable through time. Original prices no longer obtain, and book depreciation methods for fixed durables may not reflect the decline in economic values and may incorporate changes in accounting practices occasioned by changes in tax laws.

Yet it must be recognized that book values, generally representing original or acquisition costs, are the hard data available not only for private firms but also for most other organizational units that keep books. Therefore, their collection and compilation will be a necessary prerequisite to or concomitant of estimates on a current-value basis. Some analysts consider it useful to have one set of balance sheets in terms of book values. Presumably, these values have some influence on decisions, even when their limitations are recognized. They affect tax liabilities and in some cases, rate regulation. A statistical advantage to balance sheets in acquisition cost is that changes from one date to another can be explained in terms of gross investment less capital consumption without adjustments for changes in value of pre-

existing stocks. The FRB partial balance sheets incorporate largely book or par values. Yet the revaluations and current value estimates are also needed.

#### CURRENT VALUES

Current market prices provide the most useful and understandable basis for valuing and combining components of the capital stock. The national product is expressed in terms of market prices or proxies for market prices so it would be desirable for wealth to be valued on the same basis for the sake of consistency. Just as relative market prices of consumer goods represent relative degrees of satisfaction anticipated by purchasers, so do relative market prices of capital goods reflect relative present values of the future net income streams expected by the purchasers. Thus, market values of capital assets are comparable as among sectors in terms of anticipated income-producing ability and are consistent with current income. Such values can also be made comparable through time, when allowance is made for changes in market prices so as to convert the stock series to constant market prices of a stated date.

Statement of the general principle that market-price valuation of assets is desirable provides a general goal, but many practical problems are met in its implementation. Is the economist concerned with valuing a collection of individual capital goods, or with the going-concern value of the collectivity of assets? Assuming the former approach is adopted, how are the individual capital goods to be defined, particularly for comparisons through time when technological and other dynamic changes are taking place? Even if we assume that capital goods can be defined in terms of relatively homogeneous units for purposes of pricing and deflation, what can be done when asset markets are unorganized or nonexistent—what are the possible proxies for market prices? These and other general problems will be treated in the following sections prior to examination of special problems and data requirements for each of the major types of wealth.

#### GOING CONCERN VERSUS AGGREGATE WEALTH VALUATIONS

In the business sector of the economy, there is a choice between summing the values of the individual capital goods that compose the plant of the producing units and summing the value of those units as going concerns. The latter approach is spelled out in considerable detail by Prof. Vernon Smith in appendix I, part H. Basically, it involves estimating the market value of a corporation's liabilities and equity from quotations on the securities markets, and subtracting the market value of its financial assets in order to arrive at the current value of the assets residing in the enterprise.

This contrasts with the more generally advocated method of obtaining from enterprises estimates of the market value (or original cost, for purposes of revaluation) of individual items of land, structures, equipment, and inventories, by type, by establishment, and summing these by industry groupings.

Statistically, the latter procedure has advantages. The wealth estimates can be broken down by major types of assets. They can be classified by industries composed of establishments, rather than of

companies, which is preferable for production analysis. Further, the going-concern approach is not applicable to the nonbusiness sectors (governments, nonprofit institutions, and households), so the asset-type valuation approach would have to be applied to a significant portion of the economy in any case.

For the corporate sector, the data are almost entirely available for the going-concern approach, while the asset-type approach involves much estimating. But there is some question as to the validity of applying corporate asset/cash-flow ratios to noncorporate businesses, even in the same industry and size-group. Estimates by proprietors of the market value of their enterprise would likewise be speculative.

It has also been objected that stock-market valuations are volatile, and it has been suggested that centered moving averages of stock prices be used to obtain yearend values. Yet Professor Smith argues rather convincingly that volatility of expectations and price fluctuations is of the essence of value.

Finally, as Edward Denison points out in his comments to the Smith paper (also app. I, pt. H), the sum of enterprise values is not adjustable for price changes to get real stock estimates over time for purposes of production function analysis.

Theoretically, there is much to be said for implementing both approaches. Under pure competition (with perfect foresight) the value of the enterprise as defined should equal the value of the invested capital, including intangibles. In the real world, however, even with competition but without perfect knowledge, resources are generally misinvested to some degree, and cannot immediately be shifted, especially when the real capital is both specialized and long lived (as is true of railway roadbed and rolling stock, for example). With unfavorable demand developments, the sum of the value of constituent assets (determined at least in part by alternative-use value) could exceed the going-concern value of a firm, or group of firms, for many years before new investment policies brought the two back in line. In fact, if market shifts were rapid in relation to real-capital adjustments, disequilibrium could persist for decades, as has been true, broadly speaking, in American agriculture for almost half a century. Favorable market shifts could produce the opposite condition, of course. As Professor Smith points out, a comparison of the aggregate value of component assets with going-concern value, by industry, could be very useful in investment-demand analysis.

But as was stressed in the Wealth Study symposium on valuation, the going-concern valuation proposed by Professor Smith is influenced by more than the value of the underlying tangible assets. In the absence of pure competition, it reflects relative market positions of firms as influenced by the degree of monopoly, the foresight of management, and other factors. It also reflects security-market valuation of intangible capital and quasi-rents such as reside in the know-how of staff (resulting in part from company investments in research, development and training), and the peculiar organization of particular firms and industries.

Further, relative stock-market values, and changes over time, are influenced by purely financial factors, such as changes or differences in dividend payouts, income tax and capital gains, tax rates, and changes in discount rates.

Nevertheless, going-concern valuation would seem to be an interesting supplementary approach to wealth estimates in the business, and particularly the corporate, sector. After allowance for the nontangible-asset values, the going-concern values would furnish a rough check of orders of magnitude of wealth in the sector as a whole, and differences by industry would be quite significant analytically. As suggested by Mr. Gorman in appendix I, part F, liabilities plus equity at market values for the business sectors could be carried on sector and national balance sheets, with the differences between this total and the sum of the value of individual assets (including tangibles) at market carried as a separate item. In this way, the Smith approach can be incorporated in national balance sheets, but not as a basis for tangible wealth estimates by industry. In the following sections the focus is on the latter approach.

### THE LIMITATIONS OF CAPITAL GOODS MARKETS

In the existing markets for capital goods (other than inventory stocks), total turnover is generally a small proportion of the total stocks of various types. Except in the early phase of production of new types of goods, current output of the new items is generally a small proportion of the total population in existence. Turnover of used reproducible durable goods and nonreproducible goods also generally involves a minor portion of total stocks.

It would obviously be impractical to attempt to market an entire stock of capital goods in a given time period. Thus market prices applied to an entire stock signifies what could be obtained for the goods under orderly, or normal, marketing conditions. Just as the rules of commercial banking are based on the normal behavior of persons with respect to deposits and withdrawals, so the value of a stock of capital depends on normal behavior respecting replacement, resale, liquidation, and so forth.

In the case of many used reproducibles, public land, certain minerals, and several types of collectors items, there may be few if any, market transactions from one year to another. In these cases, present-day values must be estimated by some means other than application of market prices.

The use of constructed values has a counterpart in the national income accounts. The goods and services furnished by general governments and nonprofit institutions, which are not bought and sold in the usual market sense, are valued at cost (usually without allowance for a return to capital, however). Imputations are made for the rental value of owner-occupied houses and various payments in kind, often by applying the prices of similar market transactions to the number of units involved in the nonmarket situation.

### PROXIES FOR MARKET PRICES

The possible proxies for market prices of capital goods fall into three chief categories which can be introduced in terms of the several forces determining the market price. On the one hand, the demand schedule for particular capital goods reflects the estimates of potential buyers or holders of the goods of the discounted value of their



expected future contributions to income. The estimator can try to duplicate these calculations. On the other hand, in the case of reproducible capital goods, the supply schedule reflects the opportunity costs of producing or replacing the earning capacity of the item. Again, this can be estimated. Finally, the intersection of the two schedules, which would give the market price, can be estimated by persons familiar with the sporadic transactions in the item which may take place, or with markets or occasional transactions in similar types of capital goods. We shall begin with the the third approach, which may be called an appraisal technique.

#### APPRAISAL

Estimates of the current value of assets may be obtained from owners—either directly, or indirectly as through insurance valuations—or from outside appraisers who are either professionals, or other persons familiar with the property values.<sup>1</sup> The persons making the estimates will, of course, appraise levels or trends in market prices of similar assets, prospective income-producing ability, replacement cost, and other factors. The expert appraiser tries to estimate the market price that would obtain under certain hypothetical conditions—assuming, for example, willing buyers and sellers.

An approach related to the first is the use of property assessments, a form of appraisal for property tax purposes, blown up by a ratio, representing the estimated relationship between assessed and market values. This was the chief approach used in the early censuses of wealth, 1850–1922. The ratios of market to assessed values, by geographic areas, were determined by U.S. marshals and Census Bureau officials. In recent Census of Government reports, data have been gathered regarding both assessed and sales (market) values of a sample of those properties which changed hands during the year, by type and by area. Obviously, these ratios could be applied to all assessed values, by type by area, if the assumption were reasonable that the ratios obtained from the relatively small proportions of properties entering the market were representative of all properties.

The assessment approach is much more applicable to realty than to personal property. The tax laws of the various States differ much more with respect to the scope of taxable personalty than of real estate, and apparently assessment procedures differ much more widely. For real estate, however, adjusted assessment value represents a possibly attractive supplemental approach and check on estimates obtained directly from industry respondents.

#### DISCOUNTING ESTIMATED FUTURE INCOME

The second major approach involves discounting an anticipated future net income stream from assets which are income producing, but not generally bought and sold, or on whose marketability legal restrictions may have been imposed. The method is most applicable to certain lands and mineral resource reserves. It is used by the

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<sup>1</sup>Tibor Barna has found fire insurance valuations a useful approach to replacement cost in the United Kingdom. See "Alternative Methods of Measuring Capital," "Income and Wealth," series VIII; also "On Measuring Capital," in "The Theory of Capital," edited by F. A. Lutz and D. C. Hague.

Interior Department to estimate the value of certain mineral resources.

This approach involves (a) projecting the rate of production, productivity, input and output prices, and thus the gross and net receipts from use of the capital facilities; and (b) applying a discount rate to the projected net income in order to compute the present value of the property.

The projection involved is complex, but it is no more than is done whenever private firms assess the prospective profitability of new capital outlays. There is also the problem of the appropriate rate of discount, which has been discussed at some length in the literature with respect to private firms. For public bodies, the average borrowing rate has been suggested for discounting purposes.

If facilities are not used to an optimal degree of intensity, and net income is correspondingly reduced (particularly apt to be true of public wealth), the question may be raised as to whether the capital value is not underestimated by capitalizing net incomes projected at probable rates of utilization which are less than the most efficient ratio. Assuming there is no supplemental nonmonetary income, the answer appears to be in the negative, since values are relative to actual and projected income given the probable types and intensities of use. A public body is merely reducing the value of its assets to the public when it limits the use without compensating side gains.

If an actual user charge is below the optimal charge (that which maximizes present value), as is the case with some leased public properties, the latter (subsidy) may be estimated, and an imputed valuation made. The problem is even more difficult if a major portion, or all, of the services of the facilities are furnished gratis. Rather than estimate the net value of the services, less error might be involved in estimating the value of the facilities (such as a national park) in terms of its value in alternative uses (possibly as indicated by values of similar properties adjoining, or located elsewhere, but comparable).

#### REPLACEMENT COST

The most common way to approximate the market value of fixed reproducible goods (structures and equipment) is through the estimation of depreciated replacement cost. Briefly, this involves taking the purchases of each previous year, by type of good, multiplying by the ratio of the current price to the prior year's price (or price composite) to obtain gross replacement value, and then deducting depreciation, computed in accordance with the presumed pattern of loss of value as a durable good of the given type ages, in order to obtain net, or depreciated, replacement value.

The Wealth Study staff has generally favored this approach, but believes that the theoretical implications and qualifications are not often recognized. In this section, we shall explore these, and in the section on valuation of major classes of wealth we shall be concerned with the major statistical problems posed by this approach.

*Gross stock in current prices.*—First, consider the revaluation of original cost to gross replacement value to take account of price changes. In order to revalue capital goods to present (replacement) values, price indexes of new items are needed. This immediately raises the question as to what is the unit being priced or revalued. This

question is important in a dynamic economy in which the productivity of the capital goods industries is changing at the same time as are the physical characteristics and the output- and income-producing capacity of capital goods.

In viewing this problem, we agree with Edward Denison that the unit to be priced and revalued must be specified in terms of its physical characteristics, with adjustments when changes in specification are associated with differences in real production cost between the old and new models (the "ideal" procedure used by the Bureau of Labor Statistics in pricing).<sup>2</sup> It is important that the physical units of a capital good not be confused either with the inputs required for its production, which generally decline through time, or with its output capacity, which frequently increases over time.

The first confusion can be dispelled easily. Take, for example, one machine tool whose physical specifications and output capacity do not change between two periods of time, but in the production of which total productivity has doubled (real input requirements per machine cut in half). We should not say that the quantity of the capital equipment had been cut in half—this would imply a doubling of the machine tool's productivity whereas none had in fact taken place. The quantity of the machine should represent its real cost given the level of technology (productivity) in its production in the base period.

Assuming an increase in efficiency in producing a standard machine over time, its price will move to the degree that the movement of average factor price (including profit) deviates from that of the average productivity of the factors used in its production.

Next, suppose the physical characteristics and output capacity of the capital goods change, as with a model change. On this score, Denison (and the "ideal" procedure of the BLS) would adjust the real cost of the machine by the percentage difference in the real cost.

This procedure preserves the meaning of real cost as representing the cost or input at base-period technology, if we can posit that the differences in real cost of new and old models would also have obtained in the base period.

The general effect of this procedure, which is dictated by the characteristics of the price indexes, is clear. Suppose that at the end of the year 1970 the value of new depreciable assets installed during 1970 is \$100 billion. Suppose that in 1970 it would cost \$2,000 billion to reproduce (new) the depreciable assets produced prior to 1970 that still remain in the stock, but that only \$1,500 billion would be required to replace these older assets with others, incorporating current technology, that would contribute just as much to current production. By the procedure described the gross capital stock at the end of 1970 will be measured as \$2,100 billion, not \$1,600 billion. In other words, older capital will be equated with new by comparing reproduction cost at a common date, not ability to contribute to production.

*Gross stock in constant prices.*—A series for the value of the gross stock in constant prices, covering a series of years, can be obtained by substituting the prices of some one base year for current prices in the calculations. The result is to equate the goods standing in the stock

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<sup>2</sup> See Edward F. Denison, "Theoretical Aspects of Quality Change, Capital Consumption, and Net Capital Formation," in "Problems of Capital Formation," vol. 19 of "Studies in Income and Wealth"; also app. I, pt. J, to this report.

at different dates in terms of the cost of producing these goods at some one date. Thus if the gross stock of depreciable assets valued in 1970 prices should turn out to be \$2,000 billion in 1968 and \$2,100 billion in 1970, this would mean that in 1970 it would cost 5 percent more to replace the 1970 stock than the 1968 stock. But the 1970 stock would presumably be able to contribute more than 5 percent more to production than the 1968 stock because of quality improvement. In gross stock measurement, the method of equating depreciable capital produced in different years is identical in current and in constant prices.

We can illustrate the points we have been making in another way. Suppose that a given date, model  $t$  has a 10 percent higher real cost than model  $t-1$ ; that the price of model  $t$  is 15 percent higher than was the price of model  $t-1$  in year  $t-1$ ; and that model  $t$  contributes 20 percent more to production than model  $t-1$ . By our adjustment procedure the "pure" price increase is estimated to be approximately 5 percent ( $\frac{1.15}{1.10}$ ), and model  $t$  represents 10 percent more real capital than model  $t-1$ , even though it can contribute 20 percent more to production. This is the result whether it is obtained by price deflation or by weighting cost-adjusted physical units by base-period prices. It is the only result that can be obtained with the price indexes or quantity data that now exist or that we know how to construct.

It must be kept in mind that the essence of the value of capital lies in its ability to produce net income, not to produce output per se. As the output capacity of a new machines rises faster than its real cost, so, too, may the net income from its use by its early buyers. But economic theory teaches that, given workable competition, abnormal profits will gradually be competed away. Thus, prices of new machines tend to approximate their costs, including a normal profit, and net returns to new investment would tend to move much more nearly in proportion to the costs (including normal markups) of successive models of capital goods, than to their output capacities.<sup>3</sup>

In the example cited above, purchases of the new model  $t$ 's would be carried to the point where they tended to yield the same rate of return as the older model  $t-1$  had in the previous period—and thus the absolute real net income per machine would tend to be 10 (not 20) percent higher than that on the older models when they were new. The greater output capacity of the model  $t$ 's relative to their real cost would, however, be reflected in a decline in the current value of the model  $t-1$ 's. This is an important aspect of depreciation and the estimation of depreciated replacement cost, which we discuss in the next section.

In conclusion, it will be recognized that, even apart from the treatment of quality change, the gross reproduction cost of a stock of different vintages of capital goods in the prices of a given period does not reflect its anticipated capacity to produce net income, since the decline in the future net-income-producing powers of aging durables is not reflected. It does reflect what it would cost to produce the stock new in the given year. Movements through time of the gross stock in constant prices do reflect changes in the physical volume of items still in the stock, given their base-period relative prices (and adjusting for

<sup>3</sup> See John W. Kendrick, "Some Theoretical Aspects of Capital Measurement," *American Economic Review*, Vol. LI, No. 2, May 1961.

model changes in the manner specified). The estimates have an economic as well as a physical basis in that it is the economic and not the physical lifespans of the various durables which determine the dates of their retirements, and thus the size of the gross stock.

*Net stock in current prices.*—Having obtained estimates of the gross value of depreciable assets in current prices, it is possible to estimate depreciation and by deducting it, obtain the depreciated or net value. As an approach to market value, the net stock seeks to approximate the present value of the future income stream that may be expected from the capital goods. It is the measure of the value of depreciable assets that is appropriately combined with other market value estimates to arrive at the national wealth. It has also been regarded as a real net-cost measure, but allowance for depreciation is essentially an economic measure reflecting the decline in the value of an asset as it ages. That value, and indeed the lifetime, of capital goods, is a market-determined phenomenon; so also is the depreciation allowance and the net-stock estimate.

Market prices of used plants and equipment would be the most direct method of valuing depreciable assets. But since most items do not trade on organized secondhand markets, depreciation must be estimated. The past lengths-of-life of various types of capital goods can be determined from various surveys and data on scrappage. More difficult is the estimation of the shape of the depreciation curve to be applied to new purchases. This can be deduced from data on used prices of those assets which are traded, and imputed to those which are not.

It is clear that deviations between depreciated replacement cost and true market price (if it existed) could occur for two main sets of reasons. One set of reasons has to do with the inadequacy of data upon which depreciation curves are based, the stylized nature of these curves, and the fact that they are extrapolated beyond the period which furnished the data upon which they are based. The problems of estimating depreciation are discussed further in a subsequent section.

Taken in conjunction with the indirect nature of depreciation estimates, strong and persistent changes in relative demand will tend to cause market values of existing fixed assets to fall below, or rise above, the estimated depreciated replacement cost of particular assets for extended periods of time. If expectations regarding earnings of a particular class of capital goods were not realized, the market value of the used goods would fall below depreciated reproduction cost. But the deviation would be temporary, as purchase of new items fell until the return rose to the previously expected level. The relative decline in the supply of used items would tend to cause these values gradually to rise back toward depreciated replacement cost. The same sequence, *pari passu*, would tend to bring down the prices of used goods where earning power exceeded expectations through an increase in purchases of new goods and thus a gradual increase in the supply of used goods.

It is apparent that estimates of depreciated replacement cost are only more or less rough approximations to market values, actual or hypothetical. Despite their approximate nature, useful analyses have been made with wealth estimates based on the perpetual inventory method.

It is important to recognize that the method of treating quality change in equating the value of new and old capital goods to measure the net stock in current prices is the exact opposite of that implied in measurement of the gross stock. The net value of a depreciable asset falls below that of its gross value not only because it physically wears out, so that it may become physically less efficient as it ages and the remaining physically possible service life declines, but also because its ability to contribute to production declines relative to that of new capital if there is quality improvement in capital goods. This comes about because the accumulated depreciation that is deducted allows not only for physical exhaustion but also for obsolescence. Statistically, this occurs because service lives used in computing depreciation are actual lives as shortened by obsolescence, not physical lives, and because obsolescence, is, or should be, taken into account in choosing a depreciation formula. The result is that, aside from the allowance for physical factors, depreciable assets produced in different years are, in principle, equated by ability to contribute to production, not by production cost at a given date. Suppose a model  $t-1$  and a model  $t$  would both cost \$100 if produced in year  $t$ , but model  $t$  can contribute twice as much per year to production. Suppose the physical life of model  $t-1$  is half exhausted (but its ability to contribute to production is not impaired). In year  $t$  the gross stock value of the two items together is \$200. The net stock, however, is not (ignoring the discounting factor) \$150 but only \$125, the difference representing obsolescence. It is for this reason that net stock estimates can be considered approximations to current market values.

*Net stock at constant prices.*—What has just been said does not carry over to comparisons of the net stock at constant prices in different years. The obsolescence allowance affects the level of the net stock but, since a similar allowance is made in all years, it does not affect the movement of deflated net stock in anyway relevant to the treatment of quality change. Hence the interpretation to be placed upon a 5-percent increase in deflated net stock is (insofar as this point is concerned) that, in the base year, the cost of replacing the net stock of the second year would be 5 percent greater than that of replacing the net stock of the first year. If there has been quality improvement the net stock of the second year can contribute more than 5 percent additional to production.

#### MULTIPLE APPROACHES TO ESTIMATING PRESENT VALUES

If it is feasible for the estimating agency to use two independent approaches to estimates of present value, this would be desirable. In cases when owners estimate market values of depreciable assets, alternative estimates of the depreciated replacement cost by the estimating agency would be interesting. In addition to such owner or constructed estimates of market values, assessed values adjusted to market by the ratios indicated by the sample of sales would be a worthwhile check.

Reasonably close correspondence of alternative estimates would tend to confirm the validity of the numbers. Discrepancies should lead to further investigations that could result in improvements in data collection and/or estimating techniques.

## CHAPTER 7

### VALUATION—MAJOR CLASSES OF ASSETS

Problems of applying the general principles of valuation discussed in chapter 6 differ somewhat depending on the class of asset. In this chapter, we discuss the various problems in terms of the five major asset classes.

#### DEPRECIABLE ASSETS

Before proceeding to the use of depreciated replacement cost, every effort should be made to obtain direct estimates of market values of structures, machinery, and equipment. In some cases, respondents have a good notion of what their fixed assets would bring under normal market conditions. In the 1960 Census of Housing, homeowners estimated the market values of their dwellings. Many consumers also have a fair idea of the secondhand value of their automobiles, and possibly some other major durables. Producers may also know the approximate resale values of their real estate, and some of their equipment (where markets exist). To a broader degree, they probably know the replacement costs of their tangibles, particularly if they have fire insurance and keep valuations up to date for this purpose.

For the types of equipment with active secondhand markets and available price data, by model—such as automobiles, trucks, farm tractors and machinery, certain types of metalworking machinery, and some major consumer durables—the statistical agency could estimate market values from physical-unit data, by type and age. The latter type of data should be collected, and the matching price data assembled.

But for many reproducibles, the statistical agency will have to estimate depreciated replacement cost. Even when market values are available, the alternative estimates should be prepared. Not only does this provide a check, but it produces estimates of gross replacement cost which are desirable in their own right. Further, it provides the basis for continuing perpetual inventory estimates beyond the benchmark.

Estimating depreciated replacement cost involves three main sets of statistical requirements: book-value or cost data in a form suitable for further processing; adequate price indexes for revaluation; and suitable information as background for depreciation estimates.

#### COST-DATA REQUIREMENTS

In order to revalue and depreciate the capital outlays of prior periods, the basic inventory data on gross book values or original costs of surviving assets (even if no longer carried on the books) will have to be obtained and distributed by years or periods of acquisition, by type

of item. The more detail in which the composition of fixed asset inventories is obtained, the better the estimating job can be. It will be recalled that the Japanese wealth survey of 1955 obtained complete inventories from the firms and other units in the samples. The detail permits revaluation by narrow price indexes corresponding to the types of wealth, and application of appropriate depreciation rates. Broader categories could be used but the application of broader composite price indexes and depreciation rates would result in somewhat less accuracy.

Most of the working groups favored obtaining data on those broad classes of assets in the full census or survey for which book-value data were readily available for most firms. They would then get the detail for a select sample by narrow classifications (up to seven-digit Standard Commodity Classifications, as amended by conferences with industry representatives, in some cases) by recent years and earlier periods of acquisitions. The distributions from the small samples would then be applied to the data for broad classes gotten across-the-board for further processing by the estimating agency. The sample designs would be developed by experts to be consistent with existing samples used in current surveys and censuses. It is clear from the structure of American industry, however, that since a small proportion of multi-industry firms owns a large proportion of assets, most of the larger establishments would be included, while a small sample of the smaller establishments representing the smaller single-industry firms should suffice.

One problem involved in distributing book values by age is that some fixed assets on the books will have been purchased secondhand, or acquired by merger, etc. If possible, the respondent should indicate the periods of original purchase when new of these assets so that even if original costs were not available, they could be reconstructed. If original date of purchase were not available, the estimating agency could apply a conventional age adjustment to the period of acquisition by the last purchaser. Firms that no longer carry written-off assets on the books should be requested to report these separately if they continue in use. Reporting of small items below a certain value should not be required.

Pilot studies, or pretests, would be needed to determine that the necessary detail, by type and by age, could be obtained from a sufficient number of establishments in the various industries. It is apparent that the forms would run many pages, and require much effort from the respondents. This underscores the need for sufficient orientation work in advance to obtain the necessary cooperation. Possibly, if disclosure problems were overcome, detailed tabulations for the industry would be made available to respondents so that they might compare the composition of their fixed capital with that of the industry as represented in the sample. The fact that the detailed inventory would be gotten on a one-time basis should help reduce objections.

In industries for which required detail by establishment were not available, or if sufficient cooperation were not forthcoming, the age distribution of fixed assets still on the books could be roughly estimated from capital expenditure data for earlier years to which composite survival curves were applied. This method has been used by



Creamer and others, but it is to be hoped that a wealth inventory could develop more refined estimates based on more detailed data.

Since most households do not keep formal books, and in the absence of original costs, the numbers of units of various types of durable goods could be reported, by age. The estimating agency could then multiply out by average unit-values at the times of acquisition, and at the time of the survey, in order to arrive at original and replacement costs.

#### PRICE INDEXES FOR FIXED ASSETS

For revaluation, time series on prices of the various depreciable assets should extend at least as far back in time as the lengths-of-life of the items. The BLS wholesale price index (WPI) began incorporating prices of automobiles and farm equipment in 1912 or 1913 and commercial furniture in 1926. But the major expansion in pricing of machinery and equipment came in the 1952 revisions of the index when many new indexes were added, often retroactively to 1947. Some component detail and specially computed indexes go back to 1939 for machine tools, construction machinery, and general auxiliary machinery.

All in all, the Bureau now prices commodities which account for almost 40 percent of new investment in producers' durable equipment; price changes for the remaining 60 percent are imputed to the priced items. The "producer finished goods" category of the WPI constitutes over 600 commodities carrying about 11 percent of the total weight of the index. Coverage of consumers durable goods in the Consumer Price Index is even higher.

While total coverage of producers equipment in the WPI is not bad, it is quite spotty in relation to the various groupings. (See table 1 in app. I, pt. J, by Allan Searle which shows percentage coverage of 1958 value added in the four-digit capital goods industries.) Much special industry machinery and equipment, for example, has little or no price coverage. Some of the groups are covered by price indexes that originate in other agencies—notably, railroad equipment (also structures and general machinery and equipment used by railroads) priced annually since 1910 by the Section of Valuation of the Interstate Commerce Commission. The National Income Division of OBE has assembled most of the existing equipment price indexes—BLS and others, including some private indexes such as those for telephone apparatus and equipment prepared by the Western Electric Co.—in order to deflate current outlays for producers durable equipment.

Even after assembling all available data, however, some types of equipment are represented poorly, if at all. It will obviously be desirable for the BLS to continue its efforts to expand coverage in this important area. When price indexes for new types of equipment are added, it would be desirable, if feasible, to have reporters supply data for at least several prior years (longer if possible), since revaluations require indexes that cover as many years as the lifespan of the item. Some important firms have constructed historical indexes of the prices of their outputs. It would also be desirable if the Division of Prices of the BLS provided technical advice to other governmental agencies collecting price data (such as ICC) to insure appropriate and consistent method.

The BLS Division of Prices employs specification pricing. It compares the payment (or receipt) for one unit of an item or service with the payment for an identical unit at another time, specifying the unit with respect to physical characteristics and as many of the terms of the transaction as can readily be determined. The indexes are not adjusted for changes in quality (efficiency or utility) unless—

\* \* \* accompanied by physical specification changes which can be "costed out" and then only when in the judgment of the commodity specialists they do not involve purely subjective factors \* \* \*. In practice, the Bureau often obtains from reporters the cost of added (or deleted) features on machinery, autos, trucks, and a variety of other goods and makes an appropriate adjustment by adding (or subtracting) the cost to the price of the earlier model to obtain price comparability with the new model. Where this is not possible, a judgment is made and either a direct price comparison or a link is taken depending on whether the reported price change is deemed mostly due to genuine price change or to quality change. (App. I, pt. J, pp. 362-63, 364.)

This accords with the procedure which the Wealth Study recommends.

The BLS price indexes have been criticized for failing to take account of certain changes in true transactions prices, such as those involved in special "deals" or other discounts that may become widespread in times of severe competition. Since BLS has found reporters generally unwilling to report deviations of net realized prices from quoted list prices less the usual standard discounts, it is drafting plans to investigate buyers' prices as an approach to true transactions prices. The Wealth Study would encourage these efforts, particularly with respect to durable goods.

For deflating new construction outlays, the OBE has assembled all available and relevant construction cost indexes from both governmental and private sources. These cover all the major types of buildings and other structures, but unfortunately the quality of some of these indexes is not good. Some of the indexes are merely weighted averages of construction materials prices and wage rates, and even the relative weights may be out of date. They fail to reflect variations in overhead and profit margins per unit of output, and more importantly, they neglect the changes in productivity that may be taking place in the construction industry. (Notable exceptions are the price indexes for a composite mile of highway by the Bureau of Public Roads, and the ICC series for railroads and pipelines.) OBE has attempted to adjust the indexes for changing profit margins, but not for changing productivity.

Mr. Searle in appendix I, part J, reports on progress being made by the Bureau of the Census in developing more adequate price indexes for family houses built for sale, and for a segment of the apartment house market. Preliminary results suggest that the productivity factor is being reflected in these indexes. It is important for revaluation of wealth in the form of buildings and structures that progress continue to be made along these lines. Similar recommendations were made by the Price Statistics Review Committee in its report to the Bureau of the Budget in 1961 with respect to asset prices.<sup>1</sup> This is probably the largest single potential source of error in the revaluations required for wealth estimates in current prices. While coverage of

<sup>1</sup> "The Price Statistics of the Federal Government: Review, Appraisal, and Recommendations," National Bureau of Economic Research, 1961.

the capital goods price indexes could be improved as indicated, it is unlikely that the expanded composites for major types of durable goods would show greatly different movements from those now available. Accuracy of revaluation for the more detailed types would, of course, be heightened.

Finally, it may be noted that the same price indexes used for revaluation can be used for deflation of wealth estimates, by type, on successive dates. The importance of obtaining adequate price data for revaluation purposes is enhanced by their use also in deflating value time-series.

#### DEPRECIATION

Although gross replacement values are useful for some types of analyses, it is clear that depreciation on durables and depreciated replacement value must be estimated as an approximation to market value. Depreciation inevitably occurs as durable goods age and their remaining service-lives shorten, their physical efficiency diminishes to a greater or lesser extent, and they are subject to technological obsolescence. These forces reduce the remaining net income stream that can be expected, and thus their present value (assuming no offset from rising prices).

Depreciation rates are calculated ideally to approximate the patterns of decline in market value of durable goods as they age. To obtain realistic depreciation rates, it is necessary to establish (1) the average service-life and mortality dispersion for each type of durable good, and (2) typical depreciation curves over the lifetimes of durables.

Book depreciation cannot now be relied on as an accurate approximation to loss of value. Some methods of charging depreciation, such as the straight-line, appear to be less realistic than others (see below). Further, methods are sometimes changed because of changes in tax laws or other reasons. For example, accelerated depreciation was allowed on new defense facilities during the Korean conflict; and the Revenue Act of 1962 permitted new methods of charging depreciation which have been widely adopted.

In order to avoid temporal inconsistencies in depreciation and net book-value estimates, it is desirable for the estimating agency to compute depreciation on the gross original cost and replacement cost of fixed assets still in use.

Service-lives of the various types of durable goods can be determined by special studies. The Treasury Department sponsored engineering studies of producers durable equipment and structures in the late 1930's and in 1942 published Bulletin F to guide businessmen with respect to reasonable depreciation deductions for tax purposes. Supposedly, the lengths-of-life published in Bulletin F represented the averages determined by the studies, minus 15 percent. Businessmen were free to deviate from Bulletin F lives for reason, however.

In preparation for a revision in depreciation guidelines and rules in 1962, the Treasury Department undertook two surveys of service-lives actually used by companies relating to the tax year 1959-60. The primary source of the longer LDA (Life of Depreciable Assets) survey was schedule G of the corporation income-tax return, with ex-

tensive followups on incomplete returns being required. The shorter TDS (Treasury Depreciation Study), which collected data directly from respondents on a special questionnaire, was initiated when it became apparent that the LDA study would not be completed in time to plan the guideline reform.<sup>2</sup> Coverage of the corporation universe in terms of asset-size classes by the two projects is shown in the following table.

TABLE 3.—Coverage of the corporation universe by two Treasury surveys

Depreciable asset size classes	Corporation universe		LDA			TDS		
	Returns	Depreciable assets	Returns represented	Depreciable assets		Returns	Depreciable assets	
				Amount	Percent of class		Amount	Percent of class
	Thousands	Billions	Thousands	Billions		Thousands	Billions	
Total.....	1,074.1	\$397.2	556.8	\$281.2	70.8	1.9	\$231.5	58.3
Under \$1,000,000.....	1,010.2	58.6	539.3	21.0	35.8			
\$1,000,000, under \$25,000,000.....	59.6	64.8	15.0	9.0	13.9	.6	4.8	7.3
\$25,000,000 and over.....	4.3	273.8	2.5	251.3	91.8	1.4	226.7	82.8

In the LDA study, when schedule G was found to be 90 percent complete, needed data were simply abstracted. Schedules less than 90 percent complete from taxpayers with less than \$50 million of total assets were subjected to analysis and imputation of missing detail or, when this was not possible, only summary data were abstracted. Incomplete returns from firms with \$50 million or more of total assets were followed up by the appropriate district field office when it was not possible to impute detail. In some cases the taxpayer could not supply required detail.

Analysis of IRS experience in collecting data on depreciable assets indicates that schedule G was a less-than-adequate source document. Neary one-half of the returns of small corporations (under \$1 million of assets) representing almost two-thirds of assets in that size-class did not have usable data. Three-quarters of the returns of medium-size companies (over \$1 million-under \$25 million) representing almost 90 percent of assets in the size-class were unusable. More than two-thirds of the returns of very large corporations (over \$100 million in assets) provided required data, but they accounted for a lesser proportion of the assets in the size-class.

The IRS experience suggests that direct contact with the respondent by means of a sample survey may be a needed complement to a data collection program involving tax returns (which apparently necessitates a field followup in many cases.)

The TDS special questionnaire involved less than 2,000 firms but developed information on 60 percent of corporation depreciables. The LDA, which developed data on an additional 10 percent of corporate depreciables, required extraction of data from the tax records of an additional 50,000 firms.

<sup>2</sup> See Internal Revenue Service. "Depreciation Guidelines and Rules," 1962.

The LDA was partially successful in the attempt to collect depreciable assets by some 250 types of which about 25 were used for a particular industry. When detailed classification was impossible, assets were assigned to a limited number of major asset-classes. Some 30 asset types were established for the TDS of which only about 15 were used for a particular industry.

The LDA, but not the TDS, attempted to collect asset data by year of acquisition. In the end, the LDA classified assets into one of two acquisition periods, i.e., post-1953 and pre-1954, the same periods used by the TDS. Despite the cooperativeness of respondents, data by year of acquisition (except for very recent years) often could not be obtained either because the necessary records did not exist or because of the high cost of retrieving the information.

The LDA classified assets by 60 major IRS industries. In the case of multiindustry companies, the principal business activity governed the classification. Principal business activity also governed the classification of TDS assets into 60 industries. In addition, multi-industry respondents were asked to break out those assets used outside the industry of principal business activity.<sup>3</sup>

The LDA estimates of useful lives were based on data found in schedule G "Depreciation," which asks for rate of depreciation or number of years of life. Useful-life data provided a measure of the extent to which current depreciation practices had departed from Bulletin F lives. LDA included data on fully depreciated assets only to the extent that these assets were reported in schedule G. On the other hand, the TDS questionnaire specifically called for information on fully depreciated assets.

While more up to date than the old Bulletin F information, the Treasury studies have been criticized on the grounds that service lives used for tax purposes are not necessarily realistic; indeed, they are often "negotiated" and may deviate considerably from actual economic lives. (See comments by Mr. Terborgh in app. I, pt. K.) It is possible that the reserve ratio test under the 1962 Depreciation Guidelines will reduce this problem.

There obviously is need for additional and more intensive service-life studies prior to, or possibly in conjunction with, the wealth inventories. In addition to obtaining average lives for various classes of equipment, it would also be desirable to obtain survival curves. There is some difference of opinion whether depreciation should be calculated on the mean life of a depreciable asset category, or against a probable survivorship pattern (see app. I, pt. K). If categories are finely subdivided, apparently it does not make too much difference in the final result. But for purposes of estimating retirements and gross stocks, survivorship (or mortality) distributions would be desirable to have. A study in the 1930's by Robley Winfrey, based on 117 items for which data were available, is still the latest broad study of dispersion of mortality of producers durables.

Since the economic lives of capital goods probably change over time, existing data on those types for which age distributions are available should be restudied. In addition, special studies should be undertaken on a sample basis. Two types of study have been suggested.

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<sup>3</sup> Internal Revenue Service, "Corporation Income Tax Returns With Accounting Periods Ended July 1959-June 1960," table P, pp. 18-20.

By one approach, respondents are queried concerning the various types of equipment and structures retired during the previous year, and their ages. This method was followed by Jean Pennock in a study of consumer durable goods (see app. II, pt. C).

A different approach has been suggested by Mr. Wasson in appendix I, part K. From the respondents in the sample, two bits of information would be required, by asset type: (1) the value existing as of the end of the given year, including assets in use but no longer carried in the balance sheet, by year of purchase, and (2) total amounts originally purchased, by year. Wasson believes the evidence indicates that enough firms could give the desired information (possibly 20 to 25 percent) to permit computation of useful mortality tables. Terborgh also states that many companies have their assets sorted out by period of acquisition, or age. Since point (1) is the type of information we have recommended obtaining for revaluation purposes, by adding (2) for those respondents able and willing to supply it, the necessary service-life information could be gotten as part of the wealth inventories.

At what rates do depreciable assets lose value over their lifetimes? Studies were made of market prices of those types of used equipment for which resale price data are available by the Machinery and Allied Products Institute (MAPI).<sup>4</sup> The evidence suggested that the straight-line depreciation method, which then predominated, was a retarded method, and that a substantial degree of acceleration in the writeoff is realistic. The studies yielded the general result that about two-thirds of the original value of producers durable goods is lost in the first one-half of their lives—somewhat less for long-lived items such as buildings (see app. I, pt. K).

Studies by Prof. Zvi Griliches of resale values of tractors and farm machines indicate that, after the first year, a fairly constant percentage decline in value is experienced. This supports the conclusions of MAPI that double-declining balance or sum-of-the-digits methods of depreciation (which give similar results) are preferable to straight-line depreciation.

Additional studies of capital goods resale values would clearly be desirable, using such additional data as may be available, and more recent data for those durables studied by Griliches, Terborgh, and others.

No matter how good the studies, however, it must be recognized that a depreciation curve is a smoothed and stylized pattern which reality approaches only imperfectly even for groups of assets. By its very nature, depreciated replacement cost is not a perfect substitute for market price. Our chief concern is that enough of the existing information be assembled on new and resale prices of durable goods that calculations of depreciated replacement value can provide a reasonable approximation to market value.

#### INVENTORIES

It is an ideal situation when quantity data are available for the various types of goods held in inventory stocks, together with corresponding market-price or unit-value data. This is the situation in

<sup>4</sup> "Realistic Depreciation Policy," (1954).

agricultural statistics. Market values of inventories of crops and livestock, by detailed types, are estimated by multiplying numbers by unit values on a regional basis, and summing to national totals. Universal coverage is provided quinquennially by the census of agriculture, with sample survey data used for interpolation and extrapolation. Marked seasonal variations in farm inventories require adjustment.

A somewhat analogous procedure is followed by the Department of Defense, which accounts for the bulk of Federal Government inventories. Numbers of units are multiplied by "standard unit costs" which reflect the most recent prices paid for volume purchases of the inventory items.

For private industry, IRS and Census data on book values of inventories are quite extensive, but the required revaluations pose some difficult problems. Inventories are carried on the books at cost, when lower than market (prices paid in the case of supplies, and materials purchased for further processing; and embodied costs in the case of in-process or finished goods inventories). The appropriate revaluation techniques depend on the costing procedures used to charge goods to cost of sales and to inventories, respectively. The National Income Division of OBE has developed elaborate methods to revalue book values of business inventories to constant prices (the same data could be used to get current period-end values) as a step in estimating the current value of the net change in business inventories and the inventory valuation adjustment. We shall briefly describe the OBE procedure as a basis for pointing out the additional information needed to increase the accuracy of the revaluations.

OBE first divides inventory book values between those based on LIFO methods, and those on FIFO and related methods, using such information as is available. LIFO inventories are presumed to incorporate near-current prices at the time of adopting this costing procedure, plus prices prevailing at the time of inventory increases. The average prices of FIFO inventories depend on the turnover period of the inventory (gotten from the ratio of inventories to sales), which determines the number of months to use for a moving average of relevant price indexes centered on the final month end. The lag is lengthened by OBE to take account of the presumed effect of non-FIFO methods. The price index components and their weights depend on the composition of the industry inventories, not now precisely known. Prices of goods sold are used to revalue in-process and finished goods inventories, although these are carried at cost, and different firms use different methods of estimating cost.

To the extent practicable, the following additional information and data should be gotten from a small but representative sample of firms and their establishments at the time of the wealth surveys in order to improve estimates of inventories at market values.

(a) Values of inventories of establishments in multi-industry firms not yet covered by the Census Bureau.

(b) Information on the type of inventory-accounting methods used by the respondents, and the proportion of inventories to which they apply if more than one type is used.

(c) Estimates by the respondent of the current market value of the inventories (apparently estimated by many firms).

(*d*) A breakdown of the major classes of inventories—purchased, in-process, and finished goods—by at least the major types of component goods. This helps in the selection of appropriate price indexes and their weights for revaluation purposes. For major types, physical-unit data would be useful.

(*e*) Further expansion of coverage of the WPI to help improve the revaluation process. It has also been suggested that the BLS itself could weight out special purpose reflators for purchased-goods inventories, by industry.

#### MANMADE NONREPRODUCIBLE GOODS

This class of wealth comprises collections of items such as stamps, coins, antique furniture, etc., which are no longer produced (the reproductions representing a different species). Paintings and other objects of art are usually unique productions. Collections are found in both public and private galleries and museums, in households, and even in business establishments. They are probably best classed as consumer durables, yielding direct satisfaction to the viewers, except for those items intended for sale as part of business inventories.

Relatively little attention has been paid to manmade nonreproducible goods in the theoretical literature, and most wealth estimates have omitted them, presumably because of data and valuation problems. In terms of the primary uses of wealth data recited in chapter 2, this class would seem to have relatively low priority. Yet in magnitude and interest it is far from inconsequential, and we have given some thought to its possible treatment. (See especially the annex and exhibits to app. II, pt. N, on the service industries, which include galleries and museums.)

Some types of collectors items, such as stamps and coins, are traded in relatively large and active markets. The largest dealers issue catalogs with pricelists (although transaction prices generally average below catalog prices). Owners of these collections generally have a fair idea of their value, or they or qualified appraisers could readily prepare value estimates.

Even in the case of unique productions, of which the leading category is paintings, auctions and other sales take place frequently enough that appraisers and dealers can generally estimate with reasonable accuracy what a group of paintings will bring. Price indexes for paintings of various schools have been prepared, which conceivably could be used for revaluing from cost (given the date of acquisition) to current value.<sup>5</sup> About one-third of the galleries responding to a questionnaire sent out by the American Association of Museums on behalf of the Wealth Study said they could provide data on the original cost and/or present market value of their collections. Presumably, for the others appraisers could at least roughly estimate their values if the cooperation of the museums and galleries were obtained. Dealers would certainly be able to report the value of their inventories, since they are intended for sale.

Some galleries present estimates of the value of their collections in their annual reports. Managements of others are reluctant to place a

<sup>5</sup> See Richard Rush, "Art as an Investment," and Mr. Rush's statement for the Wealth Study, app. II, pt. N, annex A, exhibit C.



price tag on their treasures. In a sense, it is of course true that art has a value that cannot be captured in monetary terms; on the other hand, it is continually being traded, which opens the way for its valuation when the occasion warrants. We believe it would be of considerable interest to see the level and trend in value of collectors items, by type, relative to other consumer durable goods, public and private, and in relation to total national wealth, by region. Further exploration of the potentialities of measurement in this field is definitely indicated. It is to be hoped that the museums would lend assistance, and possibly leadership, to this endeavor.

#### VALUATION OF NATURAL RESOURCES

There are three important aspects which enter into the valuation of natural resources. First, they are nonreproducible, at least for long periods of time. Second, the supply is not quite as fixed as would appear from the first statement, mainly because some resources which exist, but are unknown, can be discovered, and because poorer quality reserves can be made useful through investment of capital and labor. Both of these factors contribute to changes in marketable or usable supply, although the naturally endowed supply is fixed. Third, at some point in time, these gifts of nature were acquired at no cost by the first taker.

The relative, and in some cases perfect, inelasticity of supply of natural resources, makes demand shifts largely responsible for changes in the prices of natural resources. As a result, frequent shifts in the demand for some natural resources have contributed to volatile price movements. These price movements, in turn, can influence the supply. High demand and associated high relative prices can lead to investment in exploration for new sources of supply, in additional refining needed to make poorer grade resources satisfactory for use, and in overhead capital required to provide access to remotely located supplies.

While the theory of natural resource value is clear, the measurement of this value is difficult. Some holdings of resources, primarily those owned by Government, are basically not for sale. Other natural resource sites may contain several distinct types of resources. Land, for example, may be used for grazing, contain growing timber, and serve as a watershed. Some natural resources may be inseparably associated in use with items of tangible capital. Roads and mine shafts are two examples.

Despite the seeming difficulties which arise in any attempt to value natural resources, two basic possibilities exist if one is willing to make various assumptions. The two possibilities are discounting expected future returns at appropriate rates of interest, and using market price data either directly (which under ideal circumstances should give the same number as the discounting approach), or through appraisals, which would employ various types of relevant data to establish "shadow prices." The approach through the cost side, applicable to depreciables, cannot be used for natural resources.

The discounting approach embodies too much speculation about the future to merit consideration as a primary method. It is used by the Department of Interior to value Federal mineral holdings, includ-

ing oil deposits in the Continental Shelf, mainly because the reserves are not being used at present. The discounting formula is applied to expected earnings over 25 years. A variant of discounting which can prove useful in some instances is simply to capitalize the revenues received for the use of certain types of resources. Government-owned parks and grazing lands are examples where this approach might be practicable. The market price approach suffers first from the absence of markets for many types of resources. Growing timber cannot be separated from the land. Certain Government-owned natural resources are not for sale, nor are watersheds, rivers, and the like.

The use of appraisal techniques to establish proxies for market prices is practicable for properties infrequently or never offered for sale. Since the appraisal would be based on a variety of data such as selling prices of comparable properties and fees paid for using the property, it is important to establish guidelines for weighting the various factors to insure consistency and comparability.

If all appraised valuations were centrally established there would be no problem from the standpoint of consistency and comparability. However, appraisal is essentially an exercise performed in the field and guidelines would be necessary. Where appraisal is the recommended valuation technique, it could be performed at various levels, from regional appraisal boards to appraisals by the owners themselves. The level at which this valuation is established would depend in large measure on the natural resources to be valued.

The foregoing discussion has set forth the various methods which could be used to value natural resources. The specific methods to be used for each major resource type are set forth in the report of the Working Group on Natural Resources (app. II, pt. F), and are summarized in chapter 10 of this report.

## VALUATION OF FINANCIAL CLAIMS

### GENERAL APPROACH

Market value is the appropriate measure of financial claims. It provides a consistent basis for intersectoral analysis. However, market values are not available for many important types of financial claims. For many short-term claims, book values are good approximations of market values. For longer term claims, market value estimates could be made in many cases by capitalizing at rates obtaining for similar claims which are publicly traded. But, this would involve making assumptions about the similarity between claims publicly traded and those privately held. Further study is needed to resolve this issue. If desired, market value estimates should not be requested from respondents; they should be estimated by appropriate central agencies after careful study, first, of the desirability of such estimates and, second, of the alternative methods which could be used to derive them.

Book values of financial claims represent the hard-core data which should be obtained from respondents in any event. These should be accompanied by footnotes describing the actual method of valuation embodied in the book-value data reported, so that the agency responsible for wealth estimates would know what adjustments were needed to accomplish the revaluation to market, if market values are con-

sidered after study, to be desirable. Regardless of the outcome on the question of desirability, market value data should be requested for publicly traded financial assets, since the additional burden on respondents would not be great. These data—book and market value for publicly traded issues—would be useful per se, and in any attempt to revalue other issues. Publicly traded liabilities should be valued at market, also, but these data need not be collected from debtors, since they could be readily computed by a central agency. The two alternatives should be costed, however, before a final decision is made.

The deflation of financial claims for purposes of time-series analysis is not recommended, since it is not clear what the underlying units, in constant dollars, represent.

#### SPECIAL VALUATION PROBLEMS

*Securities of subsidiaries and affiliates.*—The degree of consolidation reflected in company balance sheets varies widely. A standard for consolidation, such as a requirement that all subsidiaries more than 50-percent owned should be consolidated, is desirable but was not considered practicable by the Business Financial Claims Working Group. Since present consolidation practices can not be standardized easily, it should be recognized that an inconsistency will occur in the balance sheets.

As to valuation, securities of nonconsolidated subsidiaries and affiliates fall into two classes, wholly owned and partially owned. The securities of wholly owned subsidiaries cannot be revalued through use of actual market prices since none exist. In the case of less than wholly owned subsidiaries, shares of which are traded publicly, it would be possible to impute a market value to the parent company's holdings of securities of the subsidiary. The imputation may not be rigidly defensible on theoretical grounds, or feasible in view of the additional data it would require. However, such imputation would serve to provide for consistency between the valuation of securities of the subsidiary held by the parent company and others and the market value of these securities as reported by the nonconsolidated subsidiary itself.

Whether or not securities of less than wholly owned subsidiaries are revalued to market whenever possible, parent companies should be requested to report their equity in nonconsolidated subsidiaries, distinguishing between domestic and foreign companies. The book value of investment in subsidiaries often is quite useless analytically since it can bear little relationship to their present worth. While equity is still a book-value figure, it reflects more the present picture of a subsidiary than does the book value of, perhaps, a small and one-time investment, made quite far in the past. This equity figure is important enough to appear currently in the footnotes of many published corporation reports.

*The determination of market values for publicly traded securities.*—In obtaining market values for publicly traded securities included in annual balance sheets, the question arises of which price is appropriate. The price on the last trading day of the year for which the balance sheet has been prepared has the disadvantage of being too temporal and subject to speculative considerations. For companies whose fiscal yearends coincide with the calendar year, the use of December 31 prices

might reflect considerations apart from valuation of the security itself, such as those motivated by income tax laws. These objections are usually met by the defense that a price on any day reflects the valuation on that day based on a complete appraisal of economic conditions as well as institutional factors. Those who object to yearend price offer average daily price for the year, an average of highest and lowest prices for the year, some other alternative, or argue that values should not be attached at all. The problem is one appropriate for university research.

*Goodwill.*—The book value of goodwill should be obtained in order to insure that the respondents report balanced totals for assets, liabilities, and net worth. For presentation purposes, sectoral balance sheets should exclude goodwill, or encompass it in the overall revaluation accounts discussed in chapter 6.

*Claims of the Federal Government on foreigners.*—Certain long-term claims of the Federal Government pose special problems. Loans to foreigners at special (subsidy) rates of interest could be revalued based on a capitalization at the current rate of the interest received. Selection of the proper current rate would require study. Loans repayable in foreign "soft" currency present an even more complicated problem and should be shown at face value in a footnote, together with the face value of unpaid, but not formally repudiated, World War I debts.

*Life insurance and pension plans.*—An important source of wealth, primarily to the household sector, is the value of life insurance and pension plans, including OASI. There are four methods of valuing life insurance claims: (1) Net premiums (premiums less benefits); (2) cash surrendered values; (3) total assets of insurance funds; and (4) policy reserves on the books of insurers. The latter has been selected for use in the flow of funds; a discussion of all four methods is found in the Federal Reserve Bulletin (August 1959, p. 837). The discussion sets forth the basis for the selection of the last of the four methods mentioned above for the flow of funds accounts. The advantage of the fourth is that the difference between policy reserves and total assets of insurance companies reflects the savings and investment of the companies themselves. This is extremely important in building an integrated set of national economic accounts.

The treatment of pension plans raises another problem. The saving by both employees and employers in these funds does not reflect potential claims in the same manner as it does for life insurance. The flow of funds accounts handle insured pension plans in the same way as life insurance policy reserves are treated as assets in the consumer sector. For noninsured pension funds, Government employee retirement funds and the railroad retirement fund, the total asset value is included in the consumer sector. Flow of funds treats payments for OASI as current transactions, and the OASI assets—holdings of Federal Government bonds—as an offset to the Federal debt. This is done because it is felt that the asset value of the potential claims will be paid irrespective of the asset position of OASI. From a practical point of view these treatments are sound, although OASI assets should be shown as a memo item in a national balance sheet. The general topic of the valuation of potential pension-type claims should be the subject of further research.

## CHAPTER 8

### THE FEDERAL STATISTICAL SYSTEM: INTRODUCTION TO WEALTH DATA REVIEWS

With this chapter, we begin a summary review for major economic sectors and industry groupings of the wealth data currently or recently collected, pointing up the inadequacies and gaps. The evaluation of the existing wealth data and estimates provides a background for the major sector recommendations in the group reports and in chapter 12. The sector summaries presented in the following three chapters are based on the various working group reports contained in the second set of appendixes. In order to provide perspective on the sector discussions, this chapter reviews the general nature of the Federal statistical system and programs. This will make clearer the broad problems, and possibilities of strengthening and expanding the collection of wealth data and making wealth and balance sheet estimates within the framework of the national economic accounts.

While there are many private organizations in the United States, such as trade and professional associations, which collect data, the collection of broad economic and social data is generally accepted to be a governmental function. The Federal Government obviously must collect data required for its own operations and as background for the policies the Federal agencies must formulate and execute in fulfillment of their statutory obligations. In addition, it is efficient for the Government to collect data of broad general interest to business, private researchers, and other users in the private economy.

"In general, however, the Federal Government should not be expected to supply at public expense detail which primarily serves individuals or small groups for private gain. In some cases the needs of groups of this kind can be appropriately served under arrangements whereby they finance the collection and tabulation of additional detail in Government surveys which would not otherwise be obtained."<sup>1</sup>

The Federal statistical system and programs have gradually grown and expanded to meet increasing demand in ways that have implications for the expansion of wealth data and estimates. We shall discuss the several features of the system, and of the major programs, which seem relevant to a wealth inventory.

#### THE DECENTRALIZED STATISTICAL SYSTEM

Responsibility for statistical activities in the Federal Government is divided among various types of agencies, roughly according to subject matter, instead of being centralized in a single agency as is the case in some countries. The agencies have been grouped roughly into

<sup>1</sup> "A Federal Statistics Program for the 1960's," p. 12.

four broad categories according to their principal responsibilities in the publication "Statistical Services of the U.S. Government."

1. A central coordinating agency to prevent duplication, achieve balance, and develop procedures for an integrated system of Government statistics.

2. General purpose statistical agencies, whose primary function is the collection, compilation and publication of statistics in specific fields for general use.

3. Analytic and research agencies, which use statistics collected by other agencies for interpretive purposes, including preparation of composite measures.

4. Administrative and regulatory agencies, which collect statistics primarily as a byproduct of their administrative and operating responsibilities.

As developed in another study of the Federal statistical agencies and programs,<sup>2</sup> the decentralized character of Federal statistical activities is a source both of strength and weakness.

A chief strength lies in the specialization of the agencies and closer familiarity with the fields they cover than would be likely in one central statistical agency that covered all fields but which lacked close contact with operations. Thus, of the general purpose agencies, the Bureau of Labor Statistics specializes in data on labor, and the Statistical Reporting Service is the principal fact-finding agency in the field of agriculture. The Census Bureau is the largest and broadest of the general purpose agencies but is also specialized to a certain extent. The statistical arms of the administrative and regulatory agencies are obviously close to the areas for which they are charged with responsibility; for example, the Interstate Commerce Commission, Civil Aeronautics Board, Federal Power Commission, Federal Communications Commission, the Social Security Administration, and the Internal Revenue Service. Burden on respondents is minimized when data that emerge as a byproduct of administrative processes serve the purposes of general users.

Decentralization also has the traditional virtue of encouraging experimentation, with all agencies able to benefit from methodological and other advances made in pioneering offices.

The separation of estimation and analytical work permits concentration of special talents in these tasks. The Council of Economic Advisers, for example, performs only analytical work as a background for policy recommendations, drawing on all the statistical agencies. The Office of Business Economics in Commerce, the Economic Research Service in Agriculture, and the Division of Research in the Federal Reserve Board, largely draw on basic data collected elsewhere to prepare estimates and analyses of use to policymakers in the fields of business, agriculture, and banking, respectively.

The weaknesses of decentralization are also apparent. Data collected for regulatory and administrative purposes, and even the data from the general purpose agencies, may not be best suited for the specific estimates required for analytical purposes. With regard to concepts, coverage, detail, and timing, there may be inconsistencies among reports. For example, even if industry definitions are the

<sup>2</sup> "A Federal Statistics Program for the 1960's," appendix, pp. 65-69.

same, different agencies may present data for the same industry taken from a somewhat different set of respondents. As a result, differing published totals may reflect nonmeasurable response errors and processing errors, as well as statistical sampling errors. Further, there are gaps in coverage of aspects of the economy which pose a problem for development of comprehensive estimates for the economic accounts, as is the case in the construction, real estate, and service sectors.

In order to take full advantage of the strengths of decentralization and to attempt to minimize the weaknesses, the Office of Statistical Standards in the Bureau of the Budget was set up to provide central coordination and leadership in planning improvements and new programs. In its own words:

Performance of this function requires the identification of statistical needs and deficiencies. It requires decisions as to what statistics are necessary, who are the users, from what source, how and by whom should the data be gathered, and finally, provision in the budget to carry out the program.

An important part of central coordination is the development of uniform standards. Use by all agencies of standard definitions and classifications is essential to achieve comparability between statistical series.

It is obvious that the proposals contained in this report for developing more adequate wealth data and estimates would have little chance to be effectuated without the active support of the Office of Statistical Standards. In conversation with the various data-collection agencies, the Office would need to secure agreement on consistent concepts, definitions, and methodology prior to blueprinting of questionnaire schedules. Degrees of detail on types of wealth, etc., could vary according to recommendations of the several agencies after consultation with their respondents. But the detail would need to be collapsible into certain broad uniform categories specified in advance.

Further, the Office would need to plan for reporting coverage of economic areas not now covered, and plan budgetary requests for funds to finance the expansion of data-collection activity where required.

It would be desirable if the resources devoted to work on wealth and balance sheets within the agencies responsible for the national economic accounts (primarily the Office of Business Economics) could be increased somewhat to provide for carrying forward the planning for and work toward comprehensive estimates, by sector and industry. The present report outlines a general approach and major data requirements to implement it. Although it advances planning, we do not pretend that this report contains all the answers, and certainly much detailed planning and specification remain. If a small group within Government could continue the detailed planning work toward comprehensive balance sheet and wealth estimates, it could be of great value to the Office of Statistical Standards and the other statistical agencies in specifying the data requirements within an overall framework consistent with the existing accounts. As pointed out in chapter 5, the income and product accounts themselves would undoubtedly require modification in order to accommodate the most useful balance sheet elaborations.

When the Commerce Department national income accounts were first begun in the 1930's the estimates were based almost exclusively on data collected for other purposes. Only gradually over the past 30 years has the National Income Division been able to influence the

collection and tabulation of data toward greater suitability for its purposes. If coordinated planning within a consistent framework looking toward comprehensive balance sheets and wealth estimates can be accomplished, the initial results should be of considerably higher quality than the early national income and product accounts.

#### MAJOR STATISTICAL PROGRAMS

A brief summary description of major Federal statistical programs covering most of the economy will help in understanding the detailed sector reviews that follow. Some of the reports include varying amounts of wealth data; others include none; and in certain areas, reporting vehicles are lacking altogether.

The program of the Census Bureau is of central importance. It consists of complete demographic and economic censuses at regular intervals, supplemented by annual or more frequent, and occasional, surveys which show the intercensal movements of variables, often in lesser detail.

The complete censuses, containing many types of data and much geographic detail, permit rich analyses periodically. They provide a universe of data essential to the design and interpretation of annual, quarterly, and monthly sample surveys, and benchmarks into which the results of the sample surveys may be tied. The present program of periodic censuses in the United States is as follows:

Population and housing: every 10 years (for years ending in "0").

Agriculture: every 5 years (for years ending in "4" and "9").

Business (retail, wholesale, and selected service trades): every 5 years (for years ending in "3" and "8").

Manufactures: every 5 years (for years ending in "3" and "8").

Mineral industries: every 5 years (for years ending in "3" and "8").

Transportation (selected activities): every 5 years (for years ending in "3" and "8").

Governments (State and local units): every 5 years (for years ending in "2" and "7").

More frequent sample surveys cover demographic factors and housing characteristics; manufactures; retail and wholesale trade; foreign trade; State and local government finances.

The reports of the regulatory and administrative agencies cover much of transportation, communications, public utilities, banking, pension funds, unions, and certain other finance industries on at least an annual basis, and often in great detail. The Treasury Department and General Services Administration (plus agency reports) cover most Federal Government activity. The Internal Revenue Service publishes valuable data (including assets and liabilities) from tax returns of corporations, partnerships, and individuals. Based on a sample survey, the FTC and SEC together publish quarterly balance sheets and income statements for manufacturing corporations. The Balance of Payments Division of OBE conducts periodic surveys of U.S. direct investment abroad and foreign investment in the United States. Other data on foreign claims come primarily from foreign exchange forms filed compulsorily with the Treasury, and "Foreign Grants and



Credits by the United States Government" compiled by the Department of Commerce.

Yet there are serious gaps in the coverage of the economy. There have been no appropriations for a census of construction since 1939, although the Census Bureau does publish monthly reports on the value of new construction put in place, etc., based on a sample survey. The census of mineral industries is supplemented by regular product statistics, but not establishment data, collected by the Bureau of Mines. While the regulatory agencies obtain many data on the transportation, communication, and utility industries, there are no comparable centrally assembled data on the nonregulated portions of these industries. The census of transportation, first taken in 1963, represents a first step in the direction of filling the existing gaps to complete the industry data in that field.

The census of business covers only selected service trades; other service industries and the private nonprofit institutions have not been covered since some special census inquiries in the 1930's. Banking and brokerage are covered by several regulatory or supervisory agencies, but there are no comprehensive data on the real estate industry.

The extent of coverage of wealth data differs considerably from one reporting system to another. Beginning in 1958, and again in 1963, the census of manufactures included questions on the book value of depreciable and depletable assets. In 1963, similar questions were included in the company reports for the larger enterprises. But these schedules contain no type-of-asset detail. The census of agriculture has always had questions on the numbers of certain types of vehicles and machines on farms. In 1963, the new census of transportation included a truck inventory and use sample survey, and a truck and bus inventory for non-ICC-regulated for-hire carriers.

No asset information is gotten for the contract construction and mineral industries. In contrast, the reports to the regulatory agencies in the transportation, communications, and public utility industries contain a wealth of detail on assets.

For all private industries, the IRS Statistics of Income present book-value data on depreciable assets of corporations and partnerships, but these are for industries of companies and without type-of-asset detail for tangibles. It is a chief source of financial data for non-financial companies; financial data for financial corporations come largely from the reports to supervisory agencies.

The census of housing covers the stock of residences, as well as detailed data on plumbing and heating facilities, washing machines, dryers, television sets, radios, air conditioning equipment, home food freezers, and automobiles. Special surveys have covered major durables; data are available from trade sources, but they are not comprehensive and do not touch inventories of semidurables and perishables. A 1963 survey of financial characteristics of families is an important step toward increasing knowledge of methodology, as well as of substance, in the field of household financial assets and liabilities. But for comprehensive estimates of household balance sheets, a residual method must still be used.

The census of governments collects financial asset and liability data for State and local units, but virtually nothing on tangibles. Fixed

assets of higher educational institutions, public and private, are fairly well covered by the Office of Education surveys. In the Federal Government, the GSA collects rather detailed data on realty, but not on personalty. The public lands are well inventoried in terms of acreage, but valuation of purchased lands is at original cost.

This overview makes clear that the sectors differ greatly with respect to the adequacy of the reporting system generally, and with respect to the amount and detail of wealth data collected. In general, considerably more detail by tangible-asset types is needed; also age detail for purposes of revaluation, since most of the data are reported in book values. Greater detail by sector and type of instrument, is needed for financial claims. But it is clear that evaluations must be made on a sector-by-sector basis.

In the three chapters that follow we try to present a relatively detailed review of each of the various sector and industry groups with respect to the chief reporting vehicles or lack thereof, the wealth data that are available and their chief deficiencies from the viewpoint of a wealth inventory. Table 4, which follows immediately, represents an attempt to recapitulate the information on sources, but for data evaluations one must read the text of chapters 9 to 11 which are based on the sector reports.

TABLE 4.—Summary of major Federal reporting programs relating to assets, by sector

38-135-04-9

Data vehicle or report	Collecting agency	Coverage	Frequency	Tangible asset data detail (at acquisition cost except where noted)			Balance sheet data available	Special notes
				Sector of ownership	Asset type <sup>1</sup>	Geographical unit		
General vehicles: Income tax returns.	Internal Revenue Service.	All taxpayers and certain tax-exempt organizations.	Annual.....	Roughly 3-digit, SIC	L, I, O.....	IRS district domiciling the the headquarters of the taxpayer.	Required, except for sole proprietorships.	
Enterprise statistics.	Census Bureau.	10,000 largest companies covered by minerals, manufactures and business censuses.	Quinquennial...	135 industry classes, 2- to 3-digit.	Depreciable and depletable assets, other domestic, foreign assets, inventories.	None for company asset totals.	No.....	
Federal Government: Worldwide inventory of U.S. real property.	General Services Administration.	Census of Federal installations.	Annual.....	Agency.....	Detailed.....	County.....	No.....	Real property only.
Inventory of real and personal property of Department of Defense.	Department of Defense.	Census of DOD installations.	.....do.....	Military service.	.....do.....	Not published..	No.....	Inventories valued at current cost.
Treasury bulletin..	Treasury Department.	Census of agencies.....	.....do.....	Agency.....	E, O.....	None.....	Yes.....	
Federal real and personal property inventory report.	House Committee on Government Operations.	GSA, DOD, Treasury reports plus some individual reports.	.....do.....	.....do.....	Varying detail..	Varying detail..	Assets only.....	Contains present-day-value estimates for public domain and donated lands; property of the Architect of the Capitol.

See footnote at end of table, p. 103.

STAFF REPORT

TABLE 4.—Summary of major Federal reporting programs relating to assets, by sector—Continued

Data vehicle or report	Collecting agency	Coverage	Frequency	Tangible asset data detail (at acquisition cost except where noted)			Balance sheet data available	Special notes
				Sector of ownership	Asset type <sup>1</sup>	Geographical unit		
State and local government: Survey of State school systems.	Office of Education.	All public elementary and secondary schools reporting to State education department.	Biennial.....	Not applicable...	L, S, E.....	State.....	No.....	Only 37 States responded to 1959-60 survey. Replacement cost or insurance valuations could be reported if original cost data were not available. Mileage and selected cost data.
Highway statistics.	Bureau of Public Roads.	Roads and streets...	Annual.....	Level of government responsible for road.	System and surface types for State administered roads.	do.....	No.....	
Survey of public electric companies.	Federal Power Commission.	Public electric companies with capital investment of \$100,000 or more. All governmental units.	do.....	None applicable.	S, E, O.....	do.....	Asset data only..	
Census of governments.	Census Bureau..	All governmental units.	Quinquennial...	Level of government.	Major types of financial assets.	Governmental area.	Selected financial assets and liabilities.	Limited to major financial assets and liabilities.
Net foreign claims: Direct investment surveys.	Office of Business Economics.	Census of direct investment establishments owned by foreigners in United States, and by United States abroad.	Every few years.	1- and some 2-digit, SIC.	None.....	Country.....	Yes.....	
Foreign exchange forms.	Treasury Department.	All regulated transactions involving international investment.	At least once a year.	Detailed, if owner can be identified.	Major types of financial investment.	do.....	No.....	
Foreign grants and credits by the U.S. Government.	Department of Commerce.	All foreign grants and credits.	Quarterly.....	Not applicable..	Type of instrument.	do.....	No.....	

Households: Survey of financial characteristics of consumers. Census of housing.	Census for FRB Bureau of Census.	Sample of families... All housing units...	1-time..... Decennial.....		Residences, autos.	4 regions..... Yes.....	Yes*.....	*Excluding certain household tangibles. Owner-estimates of value; also counts of some appliances.
National housing inventory.	Bureau of Census.	Sample of housing units.	Quinquennial...			4 regions, SMSA's.	No.....	Owner-estimates of value; (focus of inventory is on housing changes).
CPR "consumer buying indicators".	Bureau of Census.	Subset of current population survey.	Quarterly.....					Household ownership of selected appliances and automobiles.
Agriculture: Census of agriculture.....	Bureau of Census.	All farms as defined.	Quinquennial...		None*.....	Yes.....	No.....	*Except respondent's estimate of land and structure value.
Crop reporting board estimates.	USDA.....	Crops on farms.....	Annual.....		None.....	No.....	No.....	Physical quantities only.
Construction: None.....								
Manufacturing: Census of manufactures.	Bureau of Census.	Census of manufacturing establishments.	Quinquennial...	4-digit SIC.....	Total depreciable and depletable assets and inventories.	State at 2-digit level.	No.....	Depreciable and depletable total derived from sample used in annual survey of manufactures.
Quarterly financial report for manufacturing	Federal Trade Commission-Securities and Exchange Commission.	Sample of manufacturing companies.	Quarterly.....	None.....	None.....	None.....	Yes.....	
Natural resources: Mineral facts and problems. Timber resources for America's future.	Bureau of Mines. U.S. Forest Service.	Selected data on proven resources. All timber.....	Periodic, last in 1960. Periodic, last in 1958.	None..... Public versus private commercial versus noncommercial.	Mineral type.... Relevant timber qualities.	Varying detail.. State.....	No..... No.....	Physical unit data only. Do.

See footnote at end of table, p. 103.

TABLE 4.—Summary of major Federal reporting programs relating to assets, by sector—Continued

Data vehicle or report	Collecting agency	Coverage	Frequency	Tangible asset data detail (at acquisition cost except where noted)			Balance sheet data available	Special notes
				Sector of ownership	Asset type <sup>1</sup>	Geographical unit		
Transportation: Major group 40: Forms A, C.....	ICC.....	Class I and II railroads.	Annual.....		Detailed.....	No.....	Yes.....	
Report of Pullman Co. Form H.....	ICC.....	Sleeping car companies.	do.....		Broad, I, O.....	No.....	Yes.....	1-company industry.
Report for small express companies.	ICC.....	Railway express companies.	do.....		Detailed.....	No.....	Yes.....	Filed by 1 company, only.
Major group 41: Form D.....	ICC.....	Small express companies.	do.....		do.....	No.....	Yes.....	Do.
Form E.....	ICC.....	Class I—Highway passenger carriers.	do.....		Broad, I, E, O.....	No.....	Yes.....	Smaller units within class furnish no value data.
Bus and truck carrier survey. Form G.....	Bureau of Census.	Class II—Highway passenger carriers.	Quinquennial.....		None.....	No.....	No.....	No value data.
Major group 42: Forms A, B.....	ICC.....	Census of for-hire carriers not regulated by ICC.	Annual.....		Detailed.....	No.....	Yes.....	Do.
Form C.....	ICC.....	Regulated electric railways.	do.....		do.....	No.....	Yes.....	
Bus and truck carrier survey.	Census Bureau..	Class I and II motor carriers.	Quinquennial.....		Broad, I, O.....	No.....	Yes.....	Smaller units within this class do not furnish these data.
Census of business.	do.....	Class III motor carriers.	do.....	4-digit SIC.....	None.....	Yes.....	No.....	No value data.
Major group 44: Forms M, MA-172, FMC-64.	ICC, MA, FMC.	Sample of for-hire carriers not regulated by ICC.	Quinquennial.....		None.....	Yes.....	No.....	
		Census of establishments engaged in public warehousing.	do.....		None.....	Yes.....	No.....	
		Regulated water carriers.	Annual.....		Broad, I, O.....	Yes.....	Yes.....	Additional non-standard asset types.

Forms K-A, FMC-63, Form K-C	ICC, FMC	do	do		Detailed	No	Yes	
Major group 45: Form 41	ICC	Class C water carriers.	do		Broad	No	Yes	
Form FAA-29-A	CAB	Regulated air carriers.	do		Detailed	No	Yes	Supplemental carriers file less detail. A report of physical facilities. Do.
Form FAA-29-A-1	FAA	Inspected airports	Irregular		None	No	No	
Major group 46: Form F	FAA	Cooperating airports	do		None	No	No	
Major group 47: Form F-a	ICC	Regulated pipelines	Annual		Detailed	No	Yes	
Form F-b	ICC	Class A freight forwarders.	do		Broad, I, O			Additional non-standard asset types.
Form 244	CAB	Class B freight forwarders.	do		None	No	Yes	Do.
Form B-1	CAB	Air freight forwarders.	Semiannual		Broad, I	No	Yes	
Form B-2	ICC	Refrigerated lines owned by railroads.	Annual		Detailed	No	Yes	
Form RBO	ICC	Regulated car lines.	do		Investment in cars.	No	No	
Forms PS-129, PS-130	ICC	Regulated rate bureaus.	do		None	No	Yes	
Communication and public utilities: Form M	USDA	Regulated stockyards.	do		Broad, I, L, S, E.	No	Yes	PS-130 has slightly different detail.
Depreciation studies.	FCC	Regulated telephone companies.	do		Detailed	No	Yes	
Form R, O	FCC	Bell system companies.	3-year cycle		do	Yes	No	
Form L	FCC	All telegraph companies.	Annual		do	No	Yes	
Form 324	FCC	DPLMR licenses.	do		Broad	No	Yes	
Form No. 1	FCC	Networks and broadcast stations.	do		do	Yes	No	Network tangibles not spread geographically.
Form No.1-F	FPC	Class A and B electric utilities.	do		Detailed	No	Yes	
Form 7 or 12a	FPC	Class C and D electric utilities.	do		Broad, I	No	Yes	Additional non-standard asset classes.
	REA	All current borrowers.	Monthly		do	No	Yes	Slightly more detail in annual forms.

See footnote at end of table, p. 103.

TABLE 4.—Summary of major Federal reporting programs relating to assets, by sector—Continued

Data vehicle or report	Collecting agency	Coverage	Frequency	Tangible asset data detail (at acquisition cost except where noted)			Balance sheet data available	Special notes
				Sector of ownership	Asset type <sup>1</sup>	Geographical unit		
Communication, etc.—Continued								
Form No. 2.....	FPC.....	Classes A and B natural gas companies.	Annual.....		Detailed.....	No.....	Yes.....	
Form No. 2-A.....	FPC.....	Classes C and D natural gas companies.	do.....		Broad, I.....	No.....	Yes.....	Additional non-standard asset classes.
PHS-2226-1.....	HEW.....	Most municipal waterworks.	Quinquennial.....		None.....	No.....	No.....	Inventory of physical facilities.
PHS-2398.....	HEW.....	Large municipal waterworks.	Biennial.....		None.....	No.....	No.....	Do.
PHS-1749-2.....	HEW.....	Municipal sewerage facilities.	Quinquennial.....		None.....	No.....	No.....	Do.
Census of agriculture.	Census Bureau.....	Irrigation enterprises.	Decennial.....		None.....	No.....	No.....	Part of every other census.
Trade:								
Census of business.....	do.....	Retail and wholesale establishments.	Quinquennial.....	4-digit SIC.....	None*.....	Yes.....	No.....	*Except wholesale inventories.
Retail trade report.....	do.....	Sample of retail establishments.	Annual.....	All 2-, some 3- and 4-digit industries.	Inventories.....	Yes.....	No.....	
Finance, insurance, real estate:								
Condition reports.....	FRB, FDIC, Treasury.	Federally supervised banks.	4 times a year.....		Broad.....	No.....	Yes.....	Reported book values may depart from cost.
Examination reports.	do.....	do.....	Annual.....		do.....			Some further detail provided for tangibles.
Report.....	FHLB.....	Federally supervised savings and loan institutions.	do.....		do.....	No.....	Yes.....	Reported book values may depart from cost.
Do.....	HEW.....	Federally chartered credit unions.	do.....		do.....	No.....	Yes.....	Do.
Various reports.....	USDA.....	Supervised farm credit agencies.	do.....		do.....	No.....	Yes.....	
Questionnaires.....	SEC.....	Regulated brokers and dealers.	do.....		do.....	No.....	Yes.....	



Required balance sheet. Form E.	USDA.....	Regulated commodity brokers.	.....do.....	.....do.....	No.....	Yes.....	
Welfare and pension fund reports.	ICC.....	Lessors of railroad properties.	.....do.....	Detailed	No.....	Yes.....	
Services: Census of business.	Labor.....	Funds covering 100 or more employees.	.....do.....	Insured vs. non-insured.	Broad.....	No.....	Yes*..... *Noninsured only.
Labor union and labor union pension fund reports.	Census Bureau.	Census of establishments in digit "77" SIC industries except 702 and 704.	Quinquennial...	4-digit SIC.....	Selected types...	Yes.....	No..... Physical unit detail only.
Financial statistics of institutions of higher education.	Office of Labor-Management Reports, Labor Department.	All labor unions and labor union pension funds.	Annual.....	Labor unions and labor union pension funds.	L, S, E, I, O for labor unions, operated real estate and other fixed assets for pension funds.	Not published..	Yes..... E consists of automotive equipment and office furniture, and equipment; less asset-type detail is available for unions with annual receipts of less than \$30,000.
Inventory of college and university facilities (Dec. 31, 1957).	Office of Education.	Census of public and private institutions.	Biennial.....	Public and private.	I, S, E, O.....	.....do.....	Plant fund account and selected financial data. Endowment funds covered in greater detail quinquennially for 200 largest institutions.
	.....do.....	.....do.....	Special study...	Type of control..	Detailed.....	State.....	No..... Detail on age, capacity, type of construction, physical units, estimated current-day value of entire facility.

<sup>1</sup> "Broad" means that tangible assets are spread among a relatively few classes. These may include land (L), structures (S), equipment (E), inventories (I), and other assets (O), "Detailed" means that the foregoing classes are subdivided further.

## CHAPTER 9

# REVIEW AND EVALUATION OF WEALTH DATA: THE NONBUSINESS SECTORS AND NET FOREIGN CLAIMS

### FEDERAL GOVERNMENT

Data required to construct wealth estimates and balance sheets for the Federal sector are of uneven quality. The best data are those on land, buildings, and structures and facilities (realty). Data on machinery and equipment (tangible personalty) are the most deficient. Financial asset and liability data are adequate.

The main sources of data on the Federal sector are the following:

1. Since 1955, the House Committee on Government Operations has published annually the "Federal Real and Personal Property Inventory Report" which summarizes inventory and accounting data collected by various departments of Government, either as part of their functional responsibility or, explicitly, for the House committee.

2. The General Services Administration, property custodian of the executive branch, requires that agencies report data on the acquisition cost, or size of area leased, for land, buildings, and structures and facilities; these are tabulated and published annually in "Inventory Report on Real Property Owned By The United States Throughout the World" and "Inventory Report on Real Property Leased to the United States Throughout the World."

3. The Department of Defense, in addition to reporting its realty to GSA, publishes "Real and Personal Property of the Department of Defense," which contains tabulations of inventory data for real property, construction-in-progress and tangible personal property.

4. The Treasury collects balance sheet data on tangible and intangible assets and liabilities from the accounting records of the various Government agencies which are published in the appropriate monthly Treasury Bulletin and, in a somewhat different form, in the report of the House Committee on Government Operations.

Based on the data contained in the foregoing sources, a statement of the asset position of the Federal Government on June 30, 1962, has been constructed and appears in table 5. As indicated in the footnotes, the data reflect a mixture of valuations.

### SCOPE AND CLASSIFICATION

These asset data are, for the most part, commensurate with the definition of the Federal sector recommended by the working group—"the Federal sector should include all organizational units whose programs or activities are substantially formulated and administered by Federal agencies or appointees." Within the sector, subtotals should be available for organizations which have counterparts in the private sector. This would facilitate the combination of Federal monetary in-

stitutions with all others into a financial intermediaries sector in connection with the preparation of flow of funds accounts; similarly, totals could be obtained for public and private utilities.

There is need to recast the two asset classes used in Federal property accounting—realty and personalty—into categories which are more descriptive and are consistent with those of the private sector. Data should be classified along the lines of the stubs in table 5. These categories serve to distinguish between reproducible and nonreproducible assets, real and financial assets, depletable and depreciable assets.

TABLE 5.—*Assets of the Federal Government, June 30, 1962*

	<i>Millions of dollars</i>
Cash.....	11, 244
Investments.....	5, 694
Accounts and notes receivable.....	4, 487
Loans receivable.....	26, 899
Inventories (except Department of Defense) :	
Commodities for sale, etc.....	4, 670
Work in progress.....	660
Materials and supplies.....	9, 216
Inventories, Department of Defense :	
Government-furnished material.....	2, 473
Industrial funds.....	341
Land (in United States) :	
Public domain acreage.....	<sup>1</sup> 12, 318
Donated or acquired at no cost.....	<sup>1</sup> 292
Purchased.....	3, 462
Land under control of Architect of the Capitol.....	<sup>1</sup> 97
Mineral resources.....	<sup>2</sup> 5, 422
Buildings of executive agencies, departments, and offices (in United States).....	21, 945
Buildings and improvements under control of the Architect of the Capitol.....	<sup>1</sup> 343
Structures and facilities.....	27, 046
Land, buildings, and structures and facilities outside the 50 States and District of Columbia.....	6, 668
Machinery and equipment :	
Department of Defense including the civilian functions of the Corps of Engineers.....	<sup>3</sup> 125, 124
Other.....	12, 164
Collection of the Library of Congress.....	2, 364
Construction in progress.....	7, 666
Leasehold improvements.....	130
Real estate collateral acquired.....	708
Other assets.....	7, 980
<b>Total.....</b>	<b><sup>4</sup> 299, 413</b>

<sup>1</sup> Valued at estimated present-day value.

<sup>2</sup> Valued by discounting expected future returns.

<sup>3</sup> Includes \$40,680,000,000 inventories in the supply system which are substantially valued at current procurement costs.

<sup>4</sup> Difference between this total and that of the Dawson committee (299,444) represents unallocable adjustments needed to reconcile DOD and GSA reported inventory values.

Source: See text of report of Working Group on Federal Government Wealth, app. II, pt. A.

#### VALUATION

The data for the Federal sector are now expressed in several types of values. To provide consistency both within the sector and with the rest of the economy, an attempt should be made to value all assets in current prices or reasonable proxies therefor. To this end, depre-

ciable tangible assets should be valued at gross and depreciated replacement cost; inventories, at current market; land and mineral resources, at estimated current market value. Because of the differences in data availabilities for each of these asset-type classes, the extent of the work required to produce these estimates varies.

#### DEPRECIABLE ASSETS

Within the depreciable asset category, there are two distinct types of data. Detailed inventory data, at acquisition cost, by type of asset and geographical location, exist for buildings, and structures and facilities. For machinery and equipment, other than that of the Department of Defense, only gross book-value totals are available; there are no breakdowns of agency totals by asset type or location. At least part of these aggregate figures are supported by inventory listings maintained by agencies. This is undoubtedly true for automobiles and automatic data-processing equipment, since separate inventories are taken and published for both of these categories. The Department of Defense breaks down machinery and equipment into much finer detail by asset-type, but does not provide geographical detail for these assets.

The asset-type detail for buildings, and structures and facilities is, on the whole, sufficient for revaluation purposes. The required age distribution could be obtained if agencies were requested to allocate the book-cost data shown for each asset class, among age class-intervals appropriate for revaluation. For machinery and equipment, it would be necessary, first, to obtain data on gross book value by asset type; then, such data would have to be distributed among age-class intervals. A one-time inventory of machinery and equipment, patterned after the GSA realty inventory, should be taken to achieve these data objectives. The information contained in the age distributions would also be useful in estimating depreciation. Except for certain business-type operations, such as TVA, depreciation is not presently calculated for the depreciable assets of the Federal Government. Both to recognize the fact that these assets decline in value over time, like their counterparts in the private sector, and to put the Federal sector on a basis consistent with the rest of the economy, depreciation estimates should be made. However, it might prove appropriate to report only gross replacement cost data for certain assets of the Department of Defense, such as weaponry.

#### LAND

Currently, data on public domain and donated land are reported to the House Committee on Government Operations on an "estimated present-day value" basis. This valuation concept should be extended to cover purchased lands. The current estimates of present-day value, prepared by controlling agencies, appear to take into account the relevant considerations—selling prices of similar parcels, discounted present values of income streams, etc. The only deficiency might be the lack of consistent weights applied to the factors by different agencies. The recommendations of the Public Lands Subgroup of the Natural Resources Working Group call for the establishment of regional appraisal boards which would value all public lands through

the use of guidelines drawn up centrally to insure consistency. This approach can be used beneficially in the Federal sector and many of those experts currently making such estimates would be called upon to serve on appraisal boards. Since valuation probably will be accomplished by looking at different types of land in different locations, the resulting estimates could be broken down readily into "type" and geographical subtotals.

The Public Lands Subgroup has recommended that values be determined for land alone and that timber or mineral values be estimated separately. This is the current practice in valuing public domain lands which contain minerals; land with timber is valued as a whole. Mineral values are currently obtained by discounting to the present the value of expected future income streams. The Minerals Subgroup of the Natural Resources Working Group has recommended that mineral properties be valued by estimating the current market price of the entire property including the tangible capital used to extract the minerals. A current market approach has also been recommended by the Timber Resources Subgroup for commercial forest land. Both of the last-mentioned subgroups would include land as an inseparable part of the resource to be valued. This view obviously conflicts with that of the Public Lands Subgroup. Further studies are required to determine the extent to which land can be valued apart from the resource it contains. Once this determination is made, the approach should be applied to the land and resources of both the private and public sectors.

Inventories should be valued at current market price. For many important Federal inventories, such as grain held by the CCC and strategic materials stockpiles, this criterion is probably far from being met. In these cases, special studies are needed to establish present-day values.

#### WORKING CAPITAL

Data on the financial assets and liabilities of the Federal Government seem adequate on the whole for presentation on a basis consistent with the financial claims of the rest of the economy. There are some indications that the current liabilities of certain Federal agencies are not fully covered in the balance sheet (form 220) that these agencies submit to the Treasury. While it is true that the emphasis of the House committee has been on assets, steps must be taken to insure that liabilities are adequately covered before balance sheets can be prepared. Special problems connected with the valuation of certain claims of the Federal Government on foreign countries are treated in the summary on net foreign claims later in this chapter.

#### DETAIL

The data on tangible wealth, at current-day values, should be presented in adequate detail by controlling agency, function, type, and geographical location. Detail by controlling agencies or unit is available since reporting is by unit. Functional-use detail, along the lines presently used by the Bureau of the Budget for classifying appropriations, is currently provided in the report of the House committee. Asset-type detail has been discussed above in connection with revalu-

ation. It is currently available for land, buildings, and structures and facilities, but not for machinery and equipment, except for that of the Department of Defense. Geographical detail exists, in most cases at the county level, for land, buildings, structures, and facilities located in the 50 States, and by country, for assets outside of the United States (except where security considerations prevent its publication). Such detail is not available for machinery and equipment. It should be obtained for all items in this class which are not frequently moved from location to location. In order to present wealth data on a sector-of-use, as well as a sector-of-ownership basis, the GSA should collect data on rental payments by major types of asset for land, buildings, and structures and facilities. GSA currently collects data, reported annually in "Inventory Report on Real Property Leased to the United States Throughout the World," on acreage and square feet leased by the United States by major asset-type classification. The data are not collected primarily by asset type. However, since the basic reporting unit is a lease (calling for an annual rental payment of at least \$2,000), rental payments and asset-type detail could be obtained at least for those leases involving only one asset type. An analysis should be made to determine what portion of rental-payment data, if collected, could actually be allocated among asset types, based on information currently available in these reports. This analysis would shed light on the further steps needed to obtain these data. Sampling techniques should be used wherever possible in obtaining the additional information required.

The existing data-collection system, modified as indicated above, is capable of providing the information needed to prepare wealth estimates and balance sheets for the Federal sector, valued in terms of current prices. In connection with the proposed balance sheet estimates, however, efforts should be made to discourage their use in decisions regarding the size of the Federal debt, since their analytical role for that purpose is quite limited.

#### STATE AND LOCAL GOVERNMENTS

Very few data useful for tangible wealth estimates for State and local governments have been collected. The main obstacle to the collection of such data is the apparent lack of adequate property records on the part of many units in the sector. While the working group has gone on to make recommendations concerning the desirable data objectives of the sector, it recognizes that the attainment of these goals rests on the results of a pilot study of property records. While these results may cause certain goals to be abandoned, every effort should be made to encourage State and local governments with deficient records to adopt accounting and recordkeeping standards which would provide data required for wealth estimates.

The State and local government sector is an extremely important holder of tangible wealth. According to Goldsmith's estimates, the sector owned net tangible assets valued at \$173 billion at the end of 1958. This amount represented 10 percent of the total for all sectors. State and local government tangibles were three times as large as those of the nonmilitary segment of the Federal Government. State and local government holdings of nonresidential structures were 32

percent of the 1958 total and were second in amount only to those of nonfinancial corporations. These data serve to indicate the importance of information on the State and local sector to the wealth study as a whole.

Goldsmith's estimates rest mainly on capital expenditures series accumulated to stock totals through the perpetual inventory method. The capital expenditures series are virtually the only data relevant to tangible wealth which exist for the sector. These series have been collected on a consistent basis by the Census Bureau in its census of governments, taken every fifth year, beginning in 1952. Intervening annual estimates have been prepared based on sample data. These data are broken down by expenditure class into new construction, equipment, and existing structures and land, cross-classified by function and level of government.

Aside from Goldsmith's perpetual inventory estimates and the Census series underlying them, there are scattered data for particular types of tangibles. The Office of Education compiles data on the value of public elementary and secondary school property broken down into sites, buildings, and equipment. Only 37 States and the District of Columbia reported these data; some of the respondents did not give separate totals for each of the three asset classes. A census taken in the spring of 1962 provides data on the number of instructional rooms in school plants by State, completion data (before or after 1920), combustibility, and location—in permanent buildings, nonpermanent, or offsite facilities. For public institutions of higher education, the Office of Education collects biennially comprehensive dollar totals for land, buildings, improvements other than buildings, and equipment. In addition, the Office has just completed a detailed study of higher education slated for publication under the title, "Inventory of College and University Physical Facilities, December 1957" which will be part three of a five-part study, "College and University Facilities Survey." The study provides detail by State, asset type, age, condition, and type of construction for buildings, and contains data on the historical cost and estimated present-day value of facilities.

The Bureau of Public Roads compiles data on the mileage of roads and streets by State, classified by the level of government responsible for it. Selected data on the cost of highway construction are available also.

Data in physical units but not in dollar values, exist for water and sewage facilities in communities with a population of 25,000 or more. The Public Health Service collects these data every few years. Data on expenditures for those facilities built under contract are published annually in *Engineering News-Record*. The book value, age, and depreciation, of water supply and treatment facilities are collected every 5 years (last done in 1960) on a sample basis by the American Water Works Association. The Federal Power Commission collects data annually on a census basis on the book value of plant (net and gross), equipment, other tangibles, and financial reserves of public electric companies with invested capital of \$100,000 or more.

The book value of plant and total assets of public hospitals, by type of hospital, level of government, and location are collected annually by the American Hospital Association and published in its journal.

The U.S. Outdoor Recreation Resource Review Committee has prepared an inventory of the net acreage of public nonurban outdoor recreation facilities. The data were classified by level of government for each State.

The census of governments contains the most comprehensive data on the financial claims of State and local governments. National totals for financial assets, classified by type of assets and fund are published by level of government. State totals contain less detail. There are four asset-type breaks: (1) Cash on hand and on deposit; (2) Federal Government securities; (3) State and local government securities; (4) nongovernmental securities.

As stated earlier, the degree to which any data objectives can be reached is dependent on the findings of pilot studies to determine exactly what data are available. The desirable objectives for wealth data for the State and local sector closely follow those for the Federal Government. Data objectives for the government sector as a whole are influenced by the type of detail on financial claims recommended by the Working Group on Nonfarm Business Financial Claims. The findings of the Public Lands Subgroup of the Natural Resources Working Group obviously relate to the government sector as well.

## NET FOREIGN CLAIMS

### DEFINITIONS

Before discussing the requirements for an inventory of net foreign claims, some definitional problems must be resolved. Net foreign claims comprise the claims of U.S. residents on the rest of the world, offset by the claims of the rest of the world on the United States. They represent the difference between domestic and national wealth. Domestic wealth is that which is located within the boundaries of a nation; national wealth is that throughout the world which is owned by the residents of a nation. These definitions raise three important issues:

- (1) What are the territorial boundaries of the United States?
- (2) What is the meaning of resident?
- (3) Are tangible assets to be treated as representing claims?

The boundary problem currently arises mainly in connection with the treatment of Puerto Rico. The Commonwealth is excluded from the national income accounts, but included as domestic territory in the balance of payments statistics. Since both treatments have merit, it would be preferable to cover the claims between the United States and Puerto Rico in a separate survey. This would permit the adjustment of the two major bodies of data to a consistent basis, whenever necessary.

The second problem is to determine which natural persons are residents. For balance of payments purposes a resident of a country is defined as a person who "ordinarily" lives there. For national wealth purposes a broader definition is preferred by some; namely, all persons subject to the jurisdiction of the country—its residents plus its citizens living abroad. Of the two, the former is preferable since it avoids political issues, is currently used and does not result in double counting. A statistical problem in the use of the former is that wealth



located in the United States, but owned by U.S. citizens who are foreign residents, is probably not picked up as foreign investment in the United States. But the foreign wealth of U.S. citizens residing abroad is subject to U.S. jurisdiction for tax and other purposes, and could be shown in a footnote as a contingent item. Another problem is that it can be difficult to delineate "persons ordinarily resident."

The treatment of assets of the Federal Government and its employees are special cases of both the territorial boundaries and the resident problems. The principle of extraterritoriality could be applied to the treatment of the tangible assets of national governments. If imposed, this principle would dictate that foreign tangible property located in the United States would be excluded from U.S. domestic wealth and U.S. governmental holdings of tangibles abroad would be included in both U.S. domestic and national wealth. It seems desirable, on balance, to reject extraterritoriality for statistical purposes. Federal employees serving abroad are considered as residents of the United States for balance of payments purposes and, therefore, represent an exception to the "ordinarily resident" rule.

The third problem is whether or not to create international claims corresponding to tangible assets located in one country and owned in another. The advantage of assuming that residents of one country own claims on their tangible assets located in foreign countries, rather than owning these assets directly, is that the assets can then be included as part of the domestic wealth of the host country. Otherwise, these tangibles would have to be made part of the domestic wealth of the owning country, which seems unrealistic since they contribute to output in the host country. For only one type of tangible asset—movable military equipment—does the latter type of treatment seem appropriate.

Somewhat related to the establishment of claims representing holdings of tangible wealth is the treatment of the monetary gold stock. To reflect its role as a particular type of generalized claim on foreign goods and services, and to achieve consistency with the balance of payments treatment, gold should be considered as an international asset of the United States. While to treat foreign gold holdings as a claim on the United States would be consistent with flow of funds statistics, this procedure should not be followed, since in many respects it is unrealistic.

#### THE COVERAGE OF EXISTING DATA

The international investment position of the United States at the end of 1962 is found in table 6. This table was prepared by Samuel Pizer of the Balance of Payments Division of OBE for inclusion in the report of the Net Foreign Claims Working Group (app. II, pt. D) and is also found, in somewhat lesser detail, in the Survey of Current Business, August 1963.

TABLE 6.—*International investment position of the United States, 1962*

[Millions of dollars]

1.	U.S. assets and investments abroad, total.....	80,126
2.	Private investments.....	59,810
3.	Long-term total.....	52,576
4.	Direct <sup>1</sup> .....	37,145
5.	Foreign dollar bonds <sup>2</sup> .....	6,373
	Other foreign securities:	
6.	Stocks.....	4,715
7.	Bonds.....	714
	Other long-term:	
8.	Reported by banks (form B-3).....	2,151
9.	Reported by commercial concerns (C-2).....	769
10.	Other <sup>3</sup> .....	709
11.	Short-term assets and claims, total <sup>4</sup> .....	7,234
12.	Reported by banks (B-2).....	5,038
13.	Reported by commercial concerns (C-2).....	2,111
14.	Brokerage balance (S-4).....	85
15.	U.S. Government credits and claims.....	20,316
16.	Long-term <sup>5</sup> .....	16,040
17.	Foreign currencies and short-term claims <sup>6</sup> .....	3,113
	Monetary assets:	
18.	IMF position.....	1,064
19.	Convertible currencies.....	99
20.	Foreign assets and investments in the United States, total.....	47,368
21.	Long term.....	20,201
22.	Direct <sup>7</sup> .....	7,597
23.	Corporate stocks <sup>8</sup> .....	10,336
24.	Corporate, State, and municipal bonds <sup>9</sup> .....	657
25.	Other long-term.....	1,611
26.	Reported by banks (B-3).....	4
27.	Reported by commercial concerns (C-1).....	161
28.	Other <sup>10</sup> .....	1,446
29.	Short-term assets and U.S. Government obligations.....	27,167
30.	Private obligations.....	13,340
31.	Reported by banks (B-1) <sup>11</sup> .....	12,583
32.	Reported by commercial concerns (C-1).....	645
33.	Reported by brokers (S-4).....	112
34.	U.S. Government obligations.....	13,827
35.	Long-term marketable issues <sup>12</sup> .....	2,061
36.	Special nonmarketable nonconvertible issues.....	251
37.	Short term.....	11,515
38.	Bills and certificates <sup>13</sup> .....	9,331
39.	Foreign currency certificates.....	48
40.	Currency.....	906
41.	Miscellaneous <sup>14</sup> .....	1,230

<sup>1</sup> Country and industry detail in August 1963, Survey of Current Business.<sup>2</sup> Detail by country and class of borrower being developed.<sup>3</sup> Represents values carried forward (with adjustments) from the Treasury census (TFR-500) for certain types of assets, including real estate, estates and trusts, insurance, and miscellaneous claims. The major adjustment was to eliminate part of the value of real property abroad reported by individuals who at the time were noncitizen residents of European origin.<sup>4</sup> Stabilization fund credits (\$62,000,000), are subtracted from the B-2 reports and included in Government assets.<sup>5</sup> Detail as in "Foreign Grants and Credits" except that the latter excludes (1) contributions to international organizations (other than IMF) of \$1,117,000,000, (2) nonmilitary installations abroad, \$71,000,000, and (3) miscellaneous claims and settlements, \$101,000,000.<sup>6</sup> Detail by program and country in "Foreign Grants and Credits."<sup>7</sup> Area data in August 1963 Survey of Current Business; industry breakdowns can be derived from that article and "Foreign Business Investments in the United States."<sup>8</sup> Certain country detail are available, but are not accurate. Industry data are available only for earlier years.<sup>9</sup> Transactions data do not segregate by type; corporate bonds predominated in Treasury census (TFR-300).

Additional footnotes on page 114.

The sources for most of the data contained in the table are the following:

1. Foreign exchange forms filed on a compulsory basis with the U.S. Treasury Department. (Items based on the data filed in these reports are identified in the table by a parenthetical entry indicating the specific report, viz B-1, found on the appropriate lines.)

2. Surveys of direct investment conducted by the Balance of Payments Division, OBE.

3. "Foreign Grants and Credits by the United States Government," assembled and published by the Balance of Payments Division, OBE.

4. "Census of American-Owned Assets in Foreign Countries," prepared and published by the Treasury Department for 1943, is the source of benchmarks for some series which have been updated, primarily through the transactions data collected by the Treasury Department (see 1 above).

#### GAPS IN EXISTING DATA

There are several major gaps in the coverage of these data. These gaps either have been filled by rather shaky estimates or have been ignored, of necessity.

The liabilities and portfolio holdings of foreign securities of U.S. households are inadequately covered. The liabilities are presumed to be quite small and can be ignored. On the other hand, it is important to obtain data on portfolio holdings. A stratified sampling, giving relatively great weight to high-income and foreign-born households, and sampling drawn from persons filing income tax forms reporting foreign interest- and dividends-received data are two approaches which should be evaluated.

In the government sector, foreign holdings of long-term bonds of State and local governments require the most attention. Since interest on these securities is tax exempt, a special ownership certificate procedure might be used.

While many data gaps can be found in other sectors, most of these can be closed through the balance sheet inventory recommended for nonfarm business financial claims. The inventory will provide detail on a wide variety of instruments by important maturity classes, distinguishing among those transacted with domestic entities, with foreign branches, subsidiaries, and affiliates, and with other foreigners.

The balance sheet inventory would not solve the problem of identifying bearer bonds owned by foreigners and stocks held by domestic nominees for foreigners. For bearer bonds, certificates of ownership filed when interest coupons are cashed could provide the needed information. For stocks, domestic nominees acting for foreigners could be asked to file separate reports during the wealth inventory year.

<sup>10</sup> Represents value carried forward from the Treasury census (TFR-300) for real property, estates and trusts, insurance, and miscellaneous debts and claims.

<sup>11</sup> Derived as follows:

Total reported on B-1	25, 023
Less:	
U.S. bills and certificates	12, 343
U.S. foreign currency certificates	48
IMF deposit	49

<sup>12</sup> As published in Federal Reserve Bulletin, with minor adjustments.

<sup>13</sup> Excludes IMF holdings (\$3,012).

<sup>14</sup> Includes special issues to international organizations, military procurement accounts, and other liabilities of U.S. Government agencies.

NOTE.—The designations in parentheses refer to Treasury Department forms.

In connection with this inventory it is recommended that data on income paid and received, during the year for which beginning and yearend balance sheets are to be obtained, be collected. These data would aid in the preparation of the balance of payments.

## DETAIL

The three types of detail in which it would be desirable to present national wealth statements—sector, type of asset or claim, and geographical area—are, of course, appropriate for foreign claims. Geographic detail by foreign country, while useful for many analytical purposes, is not needed to draw up a national wealth statement. However, greater detail probably will be available as a result of the data-collection efforts proposed in areas primarily concerned with wealth other than net foreign claims. The following are suggested sector and type-of-claim breakdowns for foreign claims:

## Sectors:

1. Households.<sup>1</sup>
2. Agriculture.
3. Nonfinancial business, including sole proprietorships and non-profit institutions.<sup>1</sup>
4. Financial corporations:
  - (a) Commercial banks.
  - (b) Other.
5. Government:
  - (a) Federal Government.
  - (b) Federal Reserve System.
  - (c) Other.

## Type of claim:

1. Gold (asset only).
2. Currency.
3. Deposits at banks.
  - (a) Demand.
  - (b) Time.
4. Other short-term claims:
  - (a) Money market instruments.
  - (b) Other.
5. Long-term debt:
  - (a) Marketable bonds.
  - (b) Other.
6. Direct investments:
  - (a) Subsidiaries and affiliates.
  - (b) Branches.
7. Other equities:
  - (a) Marketable stocks.
  - (b) Other.
8. Real assets:
  - (a) Consumer durables.
  - (b) Real estate.

<sup>1</sup> This sectoring presumes that foreign claims can be readily identified as to whether they relate to households or sole proprietorships. If not, the foreign claims of these two sectors would have to be combined.

## VALUATION

Three types of valuation appear in the statement of the U.S. international investment position found in table 6. Book value is used for direct investments. Market values are used for portfolio holdings of stocks and bonds for which organized markets exist. Face value is used for short-term and most long-term debt, including U.S. loans abroad.

In principle, all claims payable in money, and portfolio holdings of equities, should be valued at market. However, since markets do not exist for many categories of claims, this cannot be achieved, in fact. But market values should be obtained wherever possible. For equities, other than direct investments, the same argument holds.

Certain claims of the Federal Government, primarily loans at special interest rates, loans payable in foreign currencies, and unpaid World War I loans deserve special mention. Primarily for the sake of consistency, loans at special interest rates should be recorded at face value, although it is recognized that it is also appropriate to capitalize the loans at the going interest rate. U.S. Government loans payable in "soft" foreign currencies should be mentioned in a footnote rather than being included as part of national wealth. Differences in the terms of these loans add to the existing complexities of valuing them. Unpaid, but not formally repudiated, World War I loans should receive similar treatment.

Real assets should be valued at depreciated replacement cost because such estimates are highly useful per se, and because such treatment results in the consistent valuation of domestic and national wealth. For foreign tangibles in the United States, this presents no unusual problem. For U.S. holdings of tangibles abroad, the complex of price and investment data required for each country makes such valuation difficult. However, along with the collection of book-value data, it might prove possible to obtain the additional data on a sample basis. This possibility should be explored further. The use of depreciated replacement cost as the valuation basis for foreign direct investment in the United States and, to the extent possible, for U.S. direct investment abroad, requires that the book-value data collected for equity in direct investment establishments be adjusted to reflect this revaluation of underlying assets. Because direct investment establishments are usually closely held, it would be virtually impossible to value the equity in such investment at market prices.

## HOUSEHOLDS

There exist fairly reliable survey-based estimates of the value of housing and automobiles, two of the major components of household wealth. Counts of certain major household durables also exist, but there is a serious lack of survey data on household semidurables and soft goods.

A comprehensive survey of household tangible wealth has never been taken in this country. There have been attempts to reconstruct wealth estimates on the basis of accumulated depreciated expenditure data. The most comprehensive effort in the household field, that by Professor Goldsmith, is based on durable goods expenditures in the

national income accounts. Thus, the estimates do not include stocks of clothing, do-it-yourself home improvements, semidurable homefurnishings, and food and fuel inventories. The depreciation rates applied to expenditure data are subject to an unknown amount of error. Finally, the resulting estimate is an aggregate for the entire household sector. No distributions of data by income-size classes are produced by the perpetual inventory method of stock estimation.

#### TANGIBLE WEALTH DATA

The 1960 Census of Housing collected information about the structural characteristics, age, condition, and plumbing and heating facilities of each housing unit. An estimated market value also was obtained from those homeowners occupying nonfarm and nonbusiness single-unit residences. In addition, the Census collected information on the ownership of automobiles, washing machines, dryers, television and radio sets, air conditioners, and homefreezers. However, no data were collected regarding the value or age of the equipment. Previous Census Bureau experience indicates that respondents have considerable difficulty in answering questions about cost and year of purchase.

Estimates of the value of the stock of passenger cars are prepared by the Office of Business Economics on the basis of numbers and survival rates derived from R. L. Polk data, and detailed market price information. OBE is planning to make estimates of the stock of other categories of durables, and selected individual items within the categories.

The Department of Agriculture has taken surveys of clothing and furniture stocks in local areas, obtaining detailed data on ownership but nothing on prices paid and limited information on age of item. It also provides an annual estimate of the value of housefurnishings and household equipment on farms as a component of the Balance Sheet of Agriculture. The component is constructed by adjusting the inventory in the 1940 base year (derived from expenditure data and other sources) for subsequent acquisitions and depreciation. The acquisition data have been benchmarked on two occasions since the series was begun through the use of expenditure surveys. The most recent of these was the Labor Department's 1961 study of 9,500 urban consumer units and, in cooperation with the Agriculture Department, 4,500 rural families.

A nonrandom sample of subscribers to Consumers' Union was surveyed in 1958-60 with respect to ownership of appliances, automobiles, housing, and furniture. Prices paid, age and condition of stock were requested. Because of the nonrandom nature of the data, their main use will be in testing behavior relationships rather than in estimating aggregates or distributions.

#### ESTIMATING INTANGIBLE WEALTH

Household financial data cannot be collected as a simple adjunct to a survey of tangible assets. It is clearly established that in order to get accurate information on intangibles, the sample must be heavily weighted by high-income households.

Household financial assets and liabilities have been studied nationally in two specially designed survey projects: the FRB-Census high income project and the Survey Research Center annual consumer finances project. The 1963 FRB-Census study investigated a detailed array of items with a sample heavily weighted at high-income levels; much of the detail requested has relevance only to such a sample. Although the samples used for the Survey Research Center studies were not equal-probability samples, the high-income classes were not as heavily represented as in the FRB-Census project, and the questioning was not as detailed. The Survey Research Center study yielded underestimates of aggregate private holdings of assets and debt. Thorough evaluation of the 1963 FRB-Census study experience is an important step in planning for an inventory of household financial wealth. Two areas for especial study include the ability of respondents to provide wealth-related information, and the most efficient techniques for getting extensive information from householders.

During the 1963 study, limited financial data were collected on family businesses. Use of the household as the source of data on sole proprietorships is a collection technique which should be followed in a wealth inventory since the financial assets and liabilities of sole proprietorships often are closely related, sometimes inseparably, from the financial accounts of the household.

#### RECOMMENDED APPROACH TO DATA COLLECTION

The Working Group on Household Wealth recommends that a comprehensive survey of household wealth, both financial and tangible, by type, be undertaken. In view of their survey experience, the FRB and Census Bureau would appear to be the logical agencies to design and execute the survey, with sample households to be drawn from the 1970 census records. Technical aspects of the survey would have to be worked out by the responsible agencies, using pilot studies as required. The group suggests that the most efficient survey design would involve use of a number of different samples of households, each concentrated on a particular category of wealth and large enough to provide regional detail.

In general terms, the tangible wealth surveys would collect data on ownership, numbers, and ages of items, purchase price and/or current market values, and possibly condition and method of acquisition. Supplementary studies of service-lives and depreciation rates would be needed, as well as some additional price data to supplement that collected by BLS for the Consumer Price Index.

An alternative approach to estimating household wealth merits further investigation. This involves estimating the tangible wealth holdings of individual households from key indicator items for those same households. These key indicators, such as value of residence, age of household head, ownership of particular items, etc., would be developed from regression analysis of comprehensive data from a very small sample of households.

## CHAPTER 10

# REVIEW AND EVALUATION OF WEALTH DATA: THE COMMODITY-PRODUCING INDUSTRIES AND BUSINESS FINANCIAL CLAIMS

### AGRICULTURE

The status of wealth data and estimates in the agricultural sector, or industry, is relatively good. Much information relating to tangible assets is collected in the quinquennial censuses of agriculture. The benchmark data are extended, and sometimes supplemented, by regular and occasional sample surveys conducted by the Department of Agriculture. Nevertheless, indirect data and estimating methods are required for some items, particularly in the financial area.

On the basis of the relatively extensive direct, or indirectly relevant, data, an annual balance sheet of agriculture is prepared by the Economic Research Service of the Department of Agriculture. Table 7 shows the balance sheet detail for the first year available, 1940, and the most recent year, 1963. The subsequent discussion is in terms of the major categories shown in the table.

It will be noted that by far the largest category of wealth in agriculture is real estate, for which the data are relatively good. They are also generally adequate for the next largest category, inventories of crops and livestock. Data are less satisfactory for machinery and equipment, and least adequate for the financial items.

### THE AGRICULTURAL SECTOR

Agriculture comprises all "census farms" whose productive activities are primarily those defined as agricultural operations in the "Standard Industrial Classification Manual." (See app. II, pt. E.) Census farms were defined in the 1959 Census of Agriculture as those selling at least \$250 worth of products (or only \$50 worth if comprising 10 or more acres).

Farms are classified as commercial or noncommercial, the latter referring to institutional farms and to farms that have a primarily residential function for persons who have nonfarm jobs or are partially retired. The working group felt that for some analytical purposes, it would also be desirable to provide for several classes of commercial farms according to size as measured by receipts from marketing.

*Ownership and use.*—The census data, and the balance sheet estimates, relate to wealth used on farms. Alternative estimates on an ownership basis would be necessary to conform to the general wealth inventory objectives. This means identifying, estimating, and excluding the farm capital owned by nonfarm landlords and rented



to farm operators. No sectoral adjustment need be made for the landlord activities of those farm operators who rent land or other items to other farmers. The adjustment of wealth estimates to an ownership basis would accord with the treatment of gross farm income and product by the Commerce Department, which deducts gross rents paid to nonfarm landlords and transfers these to the real estate industry. In general, it was considered a desirable objective to coordinate the balance sheet of agriculture with the structure of the national economic accounts.

TABLE 7.—Comparative balance sheet of agriculture, Jan. 1, 1940 and Jan. 1, 1963

[In billions of dollars]

	1940	1963
<b>Assets:</b>		
Physical assets:		
Real estate <sup>1</sup> .....	33.6	142.8
Non-real-estate:		
Livestock.....	5.1	17.2
Machinery and motor vehicles <sup>1</sup> .....	3.1	19.5
Crops stored on and off farms <sup>2</sup> .....	2.7	9.2
Household furnishings and equipment.....	4.2	8.7
Financial assets:		
Deposits and currency <sup>1</sup> .....	3.2	9.2
U.S. savings bonds.....	.2	4.4
Investments in cooperatives.....	.8	4.8
Total <sup>1 3</sup> .....	52.9	215.8
<b>Claims:</b>		
Liabilities:		
Real estate debt.....	6.6	15.2
Non-real-estate debt:		
To principal institutions:		
Excluding loans held by and guaranteed by Commodity Credit Corporation.....	1.5	8.5
Loans held by and guaranteed by Commodity Credit Corporation <sup>4</sup> .....	.4	2.1
To others <sup>5</sup> .....	1.5	6.0
Total liabilities <sup>5</sup> .....	10.0	31.8
Proprietors' equities <sup>1</sup> .....	42.9	184.0
Total <sup>1 3</sup> .....	52.9	215.8

<sup>1</sup> Revised.

<sup>2</sup> Includes all crops held on farms for whatever purpose and crops held off farms as security for CCC loans.

<sup>3</sup> Total of rounded data.

<sup>4</sup> Although these are nonrecourse loans, they are included as liabilities, because borrowers must either pay them in cash or deliver the commodities on which they were based. The values of the underlying commodities are included among the assets; hence the loans must be included as liabilities to avoid overstating the amount of proprietors' equity.

<sup>5</sup> Includes individuals, merchants, dealers, and others.

Source: U.S. Department of Agriculture.

On the use basis, it should be noted that publicly owned grazing and range lands are not now included in agricultural wealth, but should be. On the other hand, some lands and other wealth on farms are used for nonfarm activities, such as hunting and fishing, or mineral extraction. In line with statistical usage, it is not necessary to try to separate the income and wealth associated with the incidental or secondary activities on the farm. If part of the wealth owned by farm operators were actually leased outside the sector, however, ad-

justments should be made, but in practice these presumably would be small and possibly negligible.

*Farm households.*—The item for farm real estate in the balance sheet includes farm residences as well as nonresidential structures and land; household furnishings and equipment are included with other tangible assets; financial assets and liabilities relate to farmers in their dual capacity as householders and farm operators. It is significant that the Working Group on Agricultural Wealth, which included several employees of the Department, felt that it was time to explore the possibilities of altering the traditional treatment of the farm sector; that it would aid analysis as well as conduce to consistent sectoring for the economy as a whole if farm household wealth were treated as part of the broad household sector and the balance sheet of agriculture were confined to the assets and liabilities of the operating business units of the industry.

#### AGRICULTURAL SERVICES

Data relating to the agricultural service industries are scanty. With the growing importance of this group of industries as agriculture becomes more specialized, better data on their current operations as well as on their assets are needed. The SIC classifications also need to be brought up to date.

#### FARM REAL ESTATE

The basic data on this principal category come from the periodic censuses of agriculture in which farm operators, by States and regions, answer the question "About how much would the land and buildings (on this farm) sell for?" Checks by the Department of Agriculture indicate that the reported values approximate market values, although some underenumeration occurs. The estimates are extended annually by sample, mail questionnaire surveys of (1) the regular crop reporters of the Department, and (2) a group of farm real estate dealers and others in contact with the local farm real estate markets.

Estimates of the separate value of farm buildings were last obtained in the 1940 census by State and extrapolated forward by crop reporter estimates of the average value per acre of improved as compared with unimproved land. In addition, estimates of farm buildings, separated between residence and service buildings, are obtained by a perpetual inventory technique. The residential component is deducted from total real estate in a series the Department presents on farm assets used in production.

Like all perpetual inventory estimates, the series for farm buildings occasionally must be tied into benchmark data. The 1969 Census of Agriculture would seem to provide a good opportunity to obtain a new benchmark for the allocation of the total value of farm real estate between land and structures, and the latter among dwellings, service buildings, and other improvements. The feasibility of obtaining farmers' estimates for several major classes of land could be explored,

possibly prior to the census. A few additional questions, together with appropriate tabulations, would permit allocation of farm real estate by sector of ownership. Valuation of the publicly owned farm lands would probably have to be determined by the administering agency.

#### FARM MACHINERY AND EQUIPMENT

There has been no benchmark survey of the total value of all farm equipment since 1945. Estimates by major categories have been made by cumulating net capital outlays in constant prices, and then reflatting to current values by price indexes compiled by the Statistical Reporting Service, Department of Agriculture. The estimates are adjusted by the periodic census data collected for automobiles and trucks on farms, tractors and major types of farm machinery. The National Survey of Farm Machinery, conducted in 1956 by the Agricultural Research Service, furnished a national benchmark for the minor types of farm machinery on farms. The vehicle but not the farm machinery data are available on a State basis.

It was evident to the working group that a new benchmark survey is necessary for the purposes of the wealth inventory, to provide State data as follows: (1) Counts and original cost (and if feasible, farmers' estimates of market value) of equipment, by type; (2) age of equipment; and (3) ownership and use of equipment if other than by the farm operator. Recurring surveys on a sample basis by region would help provide more accurate current estimates. The age estimates would assist in evaluating present USDA procedures for estimating depreciation and the related values of the stock of farm machinery and equipment. A pilot survey would be required to determine if farmers can provide reasonable estimates of the market value of used equipment, as compared with the "blue book" prices.

The stock of automobiles is now split between farm business and household use on a 60-40 basis. New data are needed with respect to this allocation.

#### INVENTORIES

*Livestock.*—Data from the censuses provide benchmark data on the number of each class of livestock. These numbers are extrapolated to January 1 of each year from USDA surveys of livestock and poultry producers. The numbers are multiplied by the average value per head on January 1 as reported by crop reporters. In general, State, and regional data are available.

There are a few gaps in the inventory position as reported. These omitted items could be covered on a one-time survey or estimated roughly by applying stock-to-receipt ratios for similar classes of animals to cash receipts for the uncovered items. The total error from an indirect estimating procedure for the several minor items would be very small.

*Crops.*—Values of crops stored on farms are gotten in essentially the same way as livestock values, except that farm prices as of the previous December 15 are applied. Crops under Commodity Credit Corporation loans are included in the Balance Sheet of Agriculture.

Both the crops and the offsetting liability entry should be excluded from the Balance Sheet.

Several items are not included in the periodic Statistical Reporting Service reports—notably forest, nursery, and greenhouse products on farms. Again, ratios to cash receipts could be applied. Also, growing crops on January 1 are not included in inventory values. Here, estimates could be made comparably with industrial in-process inventories based on the per acre outlays for major cost items times the acreage planted in crops on January 1.

#### FINANCIAL ASSETS AND LIABILITIES

Most of the USDA estimates of financial assets owned by farmers are based on indirect measures—such as the per capita deposits in cities under 15,000 population or purchases and estimated redemptions of savings bonds per capita in 600 agricultural counties. Estimated investments in farm cooperatives are of better quality, but exclusion of the net worth owned by nonfarmers is a problem. Some important types of financial assets are not included at all: corporation securities, savings in financial institutions other than commercial banks, and the cash value of life insurance.

Liability estimates are better based, particularly mortgage debt which is reported by the censuses and by lending agencies for inter-censal years. Non-real-estate debt is also reported by banks and federally sponsored lenders. That held by nonreporting lenders has been extrapolated from data based on a 1946 sample survey of nearly 2,500 farmers; these estimates are subject to a wide margin of error in recent years, but results of the 1960 Sample Census of Agriculture will improve the estimates.

Clearly, a comprehensive survey of financial assets and liabilities of farmers is needed. A preliminary pilot survey would be desirable, particularly to determine if there is a feasible way to allocate financial assets and liabilities between business and household purposes, and between farm operators and nonfarm landlords, if the sectoring recommendations are to be implemented.

The survey should be large enough to permit and improve regional balance sheet estimates, such as are now made by the Federal Reserve Bank of Atlanta.

#### NONFARM BUSINESS FINANCIAL CLAIMS

Financial claims were studied for this sector as a whole, and will be treated prior to the sections on tangible wealth by the major nonfarm industry groups.

Despite the seemingly large volume of data on financial claims, there are several important areas in which benchmark or current data either are lacking or are of inadequate quality. Other gaps relate to certain sectors or to new types of wealth in sectors presently covered. These areas will become apparent in the following review of the data sources, which will include those for nonprofit organizations.

## REVIEW OF EXISTING DATA

The most comprehensive data on business financial claims are found in the tabulations prepared annually by IRS from income tax forms. For the corporate sector, these are found in "Statistics of Income—Corporation Income Tax Returns," at the two-digit industry level, and in the IRS Source Book, at the three-digit level. These data are tabulated from the balance sheets which corporations must file. The balance sheet form contains the familiar asset, liability, and net worth accounts. These classes reflect, primarily, type of instrument, and do not give sufficient indication of the liquidity or the sector with which the transaction was made. Similar data to those of the IRS are found in Quarterly Financial Report for Manufacturing Corporations, prepared jointly and published quarterly by the FTC and SEC. These data are broken down by two-digit industry, with several further breakdowns into important subindustries.

While partnerships are not taxed as entities, they are required to file an information return which includes a balance sheet, calling for information similar to that for corporations. Less than half of the partnerships, usually the larger ones, file balance sheets. Sole proprietorships are not required to file balance sheets. IRS balance sheet tabulations for partnerships are published in "U.S. Business Tax Returns," along with similar data for corporations and income statement totals only for proprietorships.

In addition to the data tabulated for the business sector by IRS, the following special tabulations for particular industries are also available.

1. *Commercial banks.*—Various supervisory agencies collect detailed statistics on loans, investments, reserves, and other balance sheet accounts for all banks for call dates; less detailed data are collected for weekly reporting Federal Reserve member banks and are estimated by the Federal Reserve for all commercial banks.

2. *Mutual savings banks.*—Monthly estimates of broad balance sheet totals are published by the National Association of Mutual Savings Banks.

3. *Insurance companies.*—Individual companies file statements with State insurance commissions which are tabulated, together with other data for the country as a whole, by the Institute of Life Insurance (life companies) and Best & Co. (fire and casualty).

4. *Savings and loan associations.*—Estimates of major categories of wealth are prepared and published by the Federal Savings and Loan Insurance Corporation for both insured and noninsured institutions.

5. *Investment companies.*—Data for open-end companies are compiled by the Investment Company Institute from reports of members.

6. *Finance companies.*—The Federal Reserve collects annual balance sheet data for about 100 sales- and consumer-finance companies.

7. *Credit unions.*—Data for major balance sheet categories are available from the Department of Health, Education, and Welfare.

8. *Pension funds.*—The Department of Labor collects, but does not tabulate, data on every pension plan covering more than 25 employees;

the SEC publishes aggregate data based on its survey of noninsured corporate pension plans.

9. *Labor organizations.*—The Department of Labor publishes highly aggregated data on the wealth of labor unions and their pension and welfare funds.

10. *Hospitals.*—The American Hospital Association publishes annual data on the total assets and plant of nonprofit and proprietary hospitals.

11. *Charitable foundations.*—The Foundation Library Center compiles data periodically on the assets of charitable foundations; these data contain gaps in coverage and inconsistencies in valuation.

12. *Colleges.*—Data on the finances of colleges and their endowment funds are collected in a biennial survey conducted by the U.S. Office of Education.

#### GAPS IN EXISTING DATA

There are three major gaps in the coverage of the financial wealth of the business and nonprofit sectors. There are no balance sheet data for sole proprietorships. These data should be collected as part of the survey of household wealth. In many cases the assets and liabilities of proprietorships will be indistinguishable from those used in connection with the operations of the households. It is difficult to establish a conceptual basis for separating the two which can be readily implemented. When clearly identifiable, assets used in connection with the proprietorship operations should be shown separately. Some attempt should also be made to allocate commingled bank accounts between household and business uses. An alternative approach is to ask sole proprietorships to file balance sheets with their tax returns in the inventory year. In the absence of very explicit instructions as to how to distinguish between business and household items, this approach would not produce reliable and consistent data.

The second major gap is the lack of adequate data for many types of nonprofit organizations. Since data on tangibles are also inadequate for the nonprofit area (see ch. 11 for a summary of service industries), it is recommended that the entire area be surveyed for both types of wealth data, with major emphasis on tangibles. The survey should be tailored to suit each particular nonprofit area, since the quality and availability of data varies for each of them.

The third major gap has been created because less than half of the partnerships do not file balance sheets. This could be remedied if IRS made a special effort, in the year for which wealth estimates are to be prepared, to enforce the regulation requiring the filing of balance sheets by all partnerships.

#### THE COLLECTION OF NEEDED DATA

In each of the three areas in which there are gaps, as well as in the rest of the business sector, the existing data collection vehicles should be used to the greatest possible extent. Within this data collection framework, some standardization should be sought, although detail which is important in one sector may be unimportant or irrelevant in

another. Data should be collected in the form of complete balance sheets, with appropriate detail, discussed below, on assets, liabilities, and equity, and separate totals for land, depreciable and depletable assets and their associated valuation reserves, and inventories. The broad totals for tangibles should be collected to insure completeness of the balance sheet and could be useful as controls.

The appropriate reporting unit for financial data is the company. Hopefully, company totals for tangible assets collected in these balance sheets can be linked to the breakdowns of tangibles which can be distributed by industry on an establishment basis.

In the survey year, both beginning- and end-of-year balance sheet data would permit the establishment of benchmarks for flows as well as stocks.

#### REQUIRED DETAIL ON INTANGIBLES

Like that for tangible assets, detail on intangibles should provide for breakdowns by industry and by asset type—type of instrument for intangibles. Geographical detail, however, is inappropriate for the financial assets of the business sector because of the importance attached to the holdings of nationwide companies. Two additional types of detail are relevant for financial wealth data. The first relates to the liquidity of the claim. The second would permit the classification of holdings of assets and debts by broad sectors of the economy.

Industry classification of holders should be constructed with respect to major holders of intangibles, while still relating to the more detailed industry breaks recommended for tangibles. In general, the detail required for financial claims can be cast along the broader industry classes provided for in the SIC. In some cases, however, new classes need to be established by recombining certain low-order SIC subclasses. A specific class should be established for all companies engaged in leasing to more than one industry and made part of the services industries major group. Classification should begin at the highest level of aggregation and finer detail should be obtained by breaking out only the companies which clearly can be included in the narrower classes. This is a preferable alternative to attempting first to classify each company in fine detail, which may be inappropriate for multiindustry firms, and then aggregating. Specific recommendations for sectoring appear in exhibit C of appendix II, part O, "Report of the Working Group on Nonfarm Business Financial Claims." The working group recognizes that these classifications may require some modification when the wealth inventory is conducted.

Detail by type of instrument should be tailored to reflect adequately the type of financial claims important to each major industry. To achieve this, different balance sheet stubs have been developed for non-financial corporations and partnerships, nonbank financial institutions, commercial and mutual savings banks, life insurance carriers, and fire and casualty insurance companies. These stubs are presented in exhibits D through H of appendix II, part O, together with a coding to distinguish new data recommended for collection from those currently available.

These stubs also indicate the desired detail on liquidity and the sectors party to the claim. The detail on liquidity is designed to provide totals for each of three asset maturity classes—original maturity

of 1 year or less, long-term debt or installments due in 1 year or less, and long-term debt due in more than 1 year.

The suggested stubs for financial claims provide for cross-classification of claims by sector. The main sectors for which this detail is suggested are banks, nonbank financial institutions, nonfinancial corporations, unincorporated business, individuals, central governments and agencies, and State, Provincial and local governments and agencies. The detail by type of claim varies by sector.

#### VALUATION

Book-value data, gross of valuation reserves, should be collected for all balance sheet items. The valuation method should be clearly indicated in a footnote. The collection of book data, consistently valued and gross of valuation reserves, is necessary. It would permit a comparison of assets and liabilities from which an estimate of float could be obtained.

Valuation reserves should be collected in an additional column for those assets which are publicly traded. While the working group was of mixed sentiment on whether equity should be valued at market, it would seem useful to obtain such estimates for those firms with publicly traded securities.

#### BASIS OF CONSOLIDATION—DOMESTIC AND FOREIGN SUBSIDIARIES

Since the company is to be the basic reporting unit for financial data, the varying degrees of balance sheet consolidation currently employed create a problem. While a standardized basis of consolidation is desirable, it probably is not a feasible goal.

However, since data on net foreign claims are to be obtained separately, double counting could result if foreign claims and debts were not deleted from the balance sheets. Accordingly, each balance sheet should have six columns in addition to the three already discussed. The nine columns for which both beginning- and end-of-year totals should be obtained are:

- (1) Value carried on books.
- (2) Current market value (publicly traded securities only).
- (3) Valuation reserves.  
Foreign claims included (in dollars):  
    Of foreign subsidiaries and affiliates.
- (4) Book value.
- (5) Current market value.
- (6) Valuation reserves.  
    With other foreigners.
- (7) Book value.
- (8) Current market value.
- (9) Valuation reserves.

#### CONSTRUCTION

Available tangible wealth data for the contract construction industry are inadequate. Review of the Internal Revenue Service program, which is the only program collecting data on the tangible assets of the construction industry, shows that it cannot meet all the data requirements. Aside from the drawback inherent in any company data, which



often refer to more than one industrial activity, the information reported to IRS does not provide geographic detail—except that inferred from the address of the taxpayer—nor detail on equipment.

Contract construction is only one phase of construction activity. Two important groups engaged primarily in construction are classified within the real estate industry. They are the operative builders, who build and merchandise their product, and the investment builders who build for their own account. Construction is also a secondary activity of most other economic sectors. The data-collection programs for many of these sectors will have to be modified to get measures of wealth relating to their construction activities—for example, in connection with the installation of building materials by manufacturers or by retail sales firm; or the force-account construction of business, government, and even, households. Measures of the wealth of these industries should not be grouped with other aggregates, since the construction analyst may wish to combine them with the contract construction sector. Among these construction-related industries are the following (identified by SIC title and code) :

- Prefabricated wooden buildings and structural members (2433).
- Subdividers and developers (6551).
- Operative builders (6561).
- Engineering and architectural services (8911).

The collection of data from the contract construction industry could best be done through a census of construction. Such a census, of course, would serve also to collect needed nonwealth statistics. The turnover of construction firms is quite high, and the identification of business units is difficult. Not only are business failures more frequent in this sector than in any other, but its firms typically have periods of dormancy and revival.

In collecting data, considerable attention must be given to the rental of equipment by the construction industry since an unknown but probably significant proportion of its assets are in this category. Two related problems arise in the use of certain rental payments (reported by contractors) and rental receipts (reported by lessors) as the basis for allocating the value of equipment from the owning to the using economic sector. In the first place, since "leasing" can be a tax-saving technique by which equipment is purchased, the reporting of associated payments and receipts as rentals complicates the allocation procedure. Secondly, contractors may tend to report such equipment as owned when, in fact, title has not passed.

The sorts of data needed as a basis for tangible wealth estimates are much the same as reviewed in the other sector summaries, and detailed in appendix II, part G.

#### MANUFACTURING

The availability of general economic data on the manufacturing sector has grown commensurately with the importance of the sector to the national economy. Responsibility and credit for the improvement and expansion of output and consumption data on manufactures is due in large measure to the Census Bureau, which has established the framework necessary for the collection of data required to prepare wealth estimates. Collection of data on tangible assets of manufacturing establishments was resumed by the Census Bureau on a limited

basis in 1957 and continued in the 1963 census, during which large company aggregates were also obtained after a hiatus of almost 40 years.

In the interim, the IRS and, since 1947, the FTC-SEC have been the source of balance sheet data for the sector. Summary information on land, depreciable and depletable assets, and depreciation and depletion reserves and yearly additions to them, are available annually in "Statistics of Income" on a two-digit industry basis, and in the IRS Source Book, on a three-digit basis. The "Quarterly Financial Report for Manufacturing Corporations" prepared jointly by the FTC and SEC, contains data on roughly the same asset-type aggregates in two-digit detail, supplemented by several further industry breakdowns. The data sources for both FTC-SEC and IRS are samples drawn from the universe of manufacturing firms filing income tax returns (the IRS sample is much larger). FTC-SEC send their own questionnaire to the firms in their sample. Industry classification is by company, based on primary activity.

In 1957, the Census Bureau added supplemental inquiries on assets and rental payments to the annual survey of manufactures. Fifty thousand of the three hundred thousand manufacturing establishments, including all large ones, were asked to report the gross book value of their depreciable and depletable assets as of the end of 1957, accumulated depreciation as of the end of 1956, depreciation and depletion expense during 1957, and total rents paid for buildings and equipment in 1957. These data were tabulated and universe estimates were published at the four-digit SIC level for the United States and at the two-digit level for the individual States.

The impact of the resistance of respondents to the collection of wealth information at the establishment level following adoption of group-depreciation guidelines by IRS in 1962 was somewhat mitigated by an earlier decision of the Census Bureau to collect such asset and rental information for all large companies in connection with its enterprise statistics program. Only the gross book value of depreciable and depletable assets and rents for buildings and machines will be obtained from the 1963 annual survey of establishments. However, through its company summary form, Census will collect from all large manufacturing, minerals, and business firms, data on gross and net book value at the beginning and end of 1963, together with the elements of change in these company totals between the two dates—capital expenditures for plant and equipment, other acquisitions (due to mergers, etc.), depreciation and depletion charges, and other deductions such as scrappage. An aggregate figure for the book value of all other domestic assets and of foreign assets will also be obtained. These large companies also will report rental payments for buildings and structures, and for machinery and equipment. These company data will be collected from less than 3 percent of all enterprises (but they account for over two-thirds of the employment of manufacturing firms) and will be published as part of "Enterprise Statistics."

## WEALTH ESTIMATES

Various estimates of manufacturing wealth have been made. The characteristics of these estimates are summarized in table I of appendix II, part H, the report of the Working Group on Manufacturing Wealth. The estimates are based either on enumerations of book-value data primarily from the sources just described, or on the perpetual inventory method using plant and equipment investment series. For purposes of comparison, both the Census and IRS wealth data and perpetual inventory estimates of Patrick Huntley of BDSA are found in table 8. The data, in two-digit detail, are presented gross and net of depreciation for 1957 in historical-cost dollars. These three series were selected since they are fairly comparable in many respects except for the method of estimation—enumeration versus perpetual inventory and the basis of classification—company versus establishment. These differences are important to wealth estimates.

TABLE 8.—Fixed asset data and estimates for the U.S. manufacturing sector, SIC major groups, 1957<sup>1</sup>

[Millions of historical-cost dollars]

SIC major group	Gross stocks			Net stocks		
	Census (1)	IRS (2)	Huntley (3)	Census (4)	IRS (5)	Huntley (6)
20.....	\$11,731	\$9,783	\$12,430	\$5,723	\$5,428	\$6,804
21.....	400	456	415	217	257	236
22.....	4,984	4,790	5,030	2,605	2,622	2,673
23.....	1,006	643	976	444	313	526
24.....	2,917	2,519	2,956	1,332	1,636	1,653
25.....	1,041	717	930	535	402	563
26.....	7,165	6,798	6,915	4,113	4,185	4,312
27.....	3,698	3,098	3,569	1,914	1,778	2,164
28.....	13,105	14,528	11,818	6,475	7,872	7,436
29.....	7,936	28,567	7,673	3,808	14,721	5,273
30.....	1,782	2,066	2,167	781	988	1,320
31.....	467	412	471	203	206	242
32.....	5,153	5,329	5,294	2,700	3,077	3,416
33.....	17,329	20,578	18,110	8,069	10,249	12,044
34.....	5,713	4,859	5,663	2,946	2,810	3,372
35.....	9,421	8,732	7,781	4,440	4,733	5,072
36.....	4,089	4,051	4,864	2,098	2,459	3,072
37.....	9,303	12,133	9,562	4,716	6,862	6,388
38.....	1,263	1,061	1,250	744	903	809
39.....	1,987	1,732	1,649	1,026	908	1,017
Total.....	110,489	133,452	<sup>a</sup> 109,359	54,899	72,409	68,236

<sup>1</sup> Census and IRS totals include both depreciable and depletable assets while those of Patrick Huntley are for depreciable assets only; based on IRS data for 1957, depletable assets were 4.7 percent of the gross book value and 5.2 percent of the net book value. The estimates vary as to exact date in 1957.

<sup>2</sup> A total of \$115,481,000 (historical cost) was obtained by Jaszl, Wasson, and Grose in connection with their tabulations using the perpetual inventory method. Some of these tabulations appear in the Survey of Current Business, November 1962.

Source: Shown below in connection with the explanation of each stock estimate.

## EXPLANATION OF DATA

Column 1: "Supplementary Employee Costs, Cost of Maintenance and Repair, Insurance, Rent, Taxes, and Depreciation and Book Value of Depreciable Assets: 1957," 1958 Census of Manufactures. These data are on an establishment basis. SIC 39 includes SIC 19, ordnance.

Column 2: "Statistics of Income, 1957-58." These data are the sum of the depreciable and depletable asset totals shown for corporations filing returns with net income. The SIC classes comprise industries of companies filing such returns.

Column 3: "Capital Assets: The Wellspring for Economic Growth" by Patrick R. Huntley, BDSA, Department of Commerce. The data are perpetual inventory estimates of depreciable stocks only, based on Census plant and equipment expenditures series on an establishment basis.

Column 4: Source same as column 1. Derived by subtracting depreciation and depletion reserves at the end of 1956 and depreciation and depletion expenses during 1957 from gross book value of depreciable and depletable assets at the end of 1957.

Column 5: Source same as column 2. Derived by subtracting depreciation and depletion reserves from gross book value of depreciable and depletable assets. The total, derived from the returns of corporations with positive net income, is 14 percent less than the total shown for all active manufacturing corporations at that time.

Column 6: Same as column 3.

The differences between Census and IRS data arises in large part because the establishment, the Census reporting unit, is not always coterminous with the company.

Major group 29, petroleum and coal products, is an extreme example of this divergence; many of the tangibles of petroleum companies are at nonmanufacturing establishments. For manufacturing as a whole, both IRS gross and net stocks exceed those of Census. Huntley's perpetual inventory calculations of gross stock, on an establishment basis, correspond closely to those of Census; the two aggregates are within 1 percent of each other. However, his net stock totals exceed those of Census by 24 percent; also, they are greater for each two-digit industry. The excess indicates a difference between the depreciation rates actually used by the firm and those assumed by Huntley. That depreciation rate assumptions are crucial can be seen from the perpetual inventory net stock estimates of Jaszi, Wasson and Grose (Survey of Current Business, November 1962). For 1957 these range from \$55 billion constant 1954 dollars based on assumed lives 20 percent shorter than those prescribed in Bulletin F lives and using declining balance depreciation, to \$83 billion constant 1954 dollars, based on Bulletin F lives and straight line depreciation.

#### GROSS BOOK VALUE DATA

The census of manufacturers and the sample annual survey of manufacturers are well suited to the collection of gross book value data on an establishment basis. The design of the census and the annual survey both permit the tabulation of data by four-digit industry with appropriate geographical detail down through standard metropolitan statistical areas. These gross book-value data should be broken down by asset type for the broad categories of land, structures, improvements other than structures, and producers durable goods. Further breakdowns, at least equivalent to those asset-type classes established in the new IRS guidelines, should be obtained. Beyond this, conferences with industry representatives and feasibility tests should be undertaken to determine what specific asset-type detail is reportable for purposes of revaluation as well as intrinsic interest. The more detailed breaks should be based on subsamples. For each of the breakdowns finally decided upon, the sample should be designed to provide gross book-value data arrayed by groups of years of acquisition.

Procedures patterned after those outlined above would provide coverage of the manufacturing establishments in appropriate industry, geographical, and asset-type detail on an ownership basis. Two gaps would still remain—leased assets and the tangibles of central offices and auxiliaries. Estimates of leased assets would require that the data currently collected on rental payments be expanded on a sample basis, to obtain detail on asset-type classes, similar to that obtained for owned

assets. Additional questions on rents received and the value of assets outleased in the same detail would have to be added to the survey in selected industries. These data would enable the estimation of the value of leased assets, by industry and by type. Geographical detail may prove impossible to obtain for producers durable goods, but should be collected for structures if possible.

For central offices and auxiliaries, gross book-value data should be obtained on a basis consistent in asset-type and geographical detail with those of establishments. Industry detail should provide a maximum breakdown although it is recognized that four-digit industry breaks are often inappropriate for the central offices and auxiliaries of multi-industry firms. Nevertheless, it is possible, by means of the available "Enterprise Statistics" company-establishment, four-digit cross-tabulation to allocate these overhead tangibles among the industries-of-use in which the establishments they serve are classified.

#### REVALUATION

The revaluation of reproducible fixed assets to a gross replacement cost basis calls for an age distribution of gross book values by asset type, and for appropriate price indexes. The collection of the former has been discussed above. A discussion of price indexes appears in chapter 7. Estimates of depreciation are needed to arrive at net stock totals. A detailed study to determine the useful lives of structure and equipment classes is important and overdue. This might be done in conjunction with the sample surveys on fixed assets by type, by age. The findings of the studies conducted by the Treasury and IRS should not be overlooked in the initial phases of such a depreciation study. It might be necessary to use their results, if the larger study recommended here is not completed at the time of the first wealth inventory.

While these procedures will yield depreciated replacement cost estimates for fixed reproducible assets, they should be checked against market value estimates made by the owners of the tangibles. These estimates, collected on a sample basis for various types of assets, could prove to be a useful check on the depreciated replacement cost estimates which, under certain assumptions, are their proxies.

#### LAND

IRS is the most comprehensive source of gross book-value data on land. However, these data must be augmented by a considerable amount of supplementary information to be useful. As currently reported, the gross book-value data are not broken down by type; sub-totals for site, productive and vacant land would be useful.

To value land through the same approach as that described above for use in connection with fixed reproducible assets might require the collection of more land price data than can reasonably be obtained. An alternative which should be explored is to collect acreages broken down by major type, and value these at estimated current market prices.

#### INVENTORIES

Inventories are fairly well covered in the census of manufacturers. Perhaps some additional detail, especially for raw materials inventories, would be desirable.

The major problem presented by current inventory data is the lack of uniformity in valuation. The census of manufacturers' totals are a mixture of current market and FIFO- or LIFO-based cost. The departure of cost from market value is particularly acute when the LIFO method is used.

The data requirements for the revaluation of all inventories to current market need further study. Previous attempts to obtain establishment inventory data by type of valuation have been discouraging. Whatever needs emerge may best be filled, therefore, by the collection of data on a small-sample basis.

#### NONAGRICULTURAL NATURAL RESOURCES

The scope of the working group's report extends to all natural resources except agricultural and site land. Agricultural land is included in the scope of the Agricultural Working Group; site land, in the various other sector working groups on an ownership basis. The various natural resources were divided into five major types, each of which was considered by a subgroup of the overall working group. The five major types were minerals, timber, water, fish and wildlife, and public lands.

#### REVIEW OF EXISTING DATA

For each of the major classes of natural resources, there usually is a separate source of data. There are three sources of data on the mineral industries. IRS collects balance sheets from companies in the industry. Depletable assets and depletion reserves, and depreciable assets and depreciation reserves are shown separately at book value. The depreciable assets account does not provide a basis for the necessary distinction between tangibles used in mining and those used further to refine and manufacture mineral products. In addition, IRS classification on a company basis, by primary activity, often results in the inclusion of mining assets of primarily manufacturing companies in the manufacturing sector. The various censuses of mineral industries do not present this latter problem, since they are conducted on an establishment basis. However, no direct data on wealth are collected in these censuses. Only capital expenditures data are obtained, broken down into development and exploration, preparation plants constructed, other construction, new machinery and equipment, and used plant and equipment. A separate classification gives the value of purchased machinery installed. The Federal Government estimates the present-day values of its mineral holdings, based on a discounting of future returns.

Physical data on the reserves of mineral resources are available from several sources. The most comprehensive of these are the "Minerals Yearbook" and periodic editions of "Mineral Facts and Problems" published by the Bureau of Mines, based largely on data collected by the Geological Survey. Trade associations, such as the American Petroleum Institute, publish data relating to areas of their concern.

Data on timber resources in 1952 were published in "Timber Resources for America's Future," prepared by the Forest Service, Department of Agriculture. These are physical-unit data, broken down

by State, type and size of tree, rates of growth, etc., and by ownership—public or private—and use—commercial or noncommercial.

No adequate data, physical quantities or dollar value, are available for fish and wildlife. Data on the cost of boats used by commercial fisheries will be available for 1964 from a special Census Bureau survey. Fragmentary data exist on the fees paid for access to game fishing and wildlife preserves.

"The Federal Real and Personal Property Inventory Report" provides data on the acreage, State in which located, major use, and present-day value, for public domain and donated land, and cost for purchased land. Data on the number and acreage of State parks and municipal parks (for cities of 100,000 population and over) were compiled by Marion Clawson in 1958 in "Statistics on Outdoor Recreation" published by Resources for the Future, Inc.; annual data are published by the U.S. Bureau of Outdoor Recreation and the National Recreation Association. No comprehensive data on other State and local government lands are centrally available, although the various governments probably have some records which contain such information.

Physical data on water, and cost figures for capital expenditures related to water resources, are available for some, but not all locations, and in varying detail.

#### DATA OBJECTIVES AND METHODS FOR VALUING NATURAL RESOURCE WEALTH

The bulk of the data on natural resources are physical measures of supply. Filling the gaps in such data identified above should be the first step in the wealth inventory. Book-value data, where available, are totally unrelated to current market, and a suitable basis for adjusting them to reflect current value does not exist. Book-value data on the tangible assets employed to transform the resources to usable form can be revalued to depreciated replacement cost using the same methods as those recommended for other tangibles. The value of some tangibles, however, which are inseparably bound to the resource they are used to exploit, such as mine shafts, cannot be valued separately. In these cases, the best approach is to ask respondents for their estimates of the value of the whole property or to estimate this value using sales prices of similar properties as a guide. These values could be updated through series on capital outlays and depreciation and depletion allowances. This approach is recommended mainly for mineral resources and forest acres containing growing timber, the value of which is not separable from that of the land. The data required from respondents could be obtained through the mineral industries censuses and the Forest Service survey.

In the case of mature timber, the Forest Service's inventory multiplied by current market prices would produce current-day value estimates.

For public lands, regional appraisal boards could establish current-day values. To do this they would need a full physical inventory of the land, currently lacking for much land owned by State and local governments. These appraisal boards should make every effort to value land only, apart from its other aspects, such as mineral content or timber. Sales of comparable tracts and revenues charged for the

use of these lands would enter into the valuation procedure, guidelines for which should be determined centrally to achieve consistency.

The method recommended for valuing fish, other than game fish, is to capitalize the excess of actual capital investment in the industry over the minimum amount of capital needed to obtain the same catch if all capital were fully utilized. This implies the existence of excess capacity in the industry due to the free nature of the resource. Data on both the actual and minimum-needed investment will have to be estimated. An inventory of game fish and wildlife, together with value estimates based on access charges, would provide a picture of this sector.

Further study and research are required and suggested to develop an approach to valuing water. Water values would be omitted from any near-term inventory. Capital investment data on water-related tangibles need to be more comprehensive than they currently are, but the cost of filling the gaps is not deemed to be high. The same is true of data measuring the physical attributes of water. A complete listing of data requirements is found in the report of the Water Resources Subgroup.



## CHAPTER 11

### REVIEW AND EVALUATION OF WEALTH DATA: THE NONCOMMODITY-PRODUCING INDUSTRIES

#### TRANSPORTATION

Available data related to transportation wealth are good. No other major industrial group reports information in richer detail. The comparability of this detail is high since the use of uniform systems of account, which govern the classification of transactions, is common in the transportation sector.

The major sources of data on the transportation sector are the annual reports filed with Federal regulatory agencies. However, this pattern of reporting is responsible for the major defect in transportation data: when an agency has no regulatory interest in a segment of an industry, it cannot require that segment to file reports. While the lapse in coverage is most pronounced in connection with intrastate commerce, it also is observable with some kinds of interstate transportation. This checkerboard pattern of coverage contrasts with that found in those sectors subject to economic censuses, e.g., manufacturing or agriculture, where the collection of global data is a major objective.

The transportation sector consists of seven major industrial groups within the "Standard Industrial Classification Manual":

<i>Title</i>	<i>Group No.</i>
Railroad transportation.....	40
Local and suburban transit and interurban passenger transportation.....	41
Motor freight transportation and warehousing.....	42
Water transportation.....	44
Transportation by air.....	45
Pipeline transportation.....	46
Transportation services.....	47

Available data about each will be reviewed briefly. Attention first will focus on the completeness of statistical coverage and the identity of the data collection agency. Later, the asset data contained in the regulatory reports will be discussed.

#### STATISTICAL COVERAGE OF THE TRANSPORTATION INDUSTRIES

Railroad transportation now accounts for two-thirds of the gross investment in transportation. Each company within the industry is required to file an annual report with the Interstate Commerce Commission.

Until recently, the only Federal reporting program operating in the area of interurban passenger transportation was that of the ICC which required reports from highway passenger carriers engaging in interstate commerce. The bus and truck carrier survey, one element of the 1963 Census of Transportation, reaches for-hire operators not

regulated by the ICC. The 1963 questionnaire, however, does not request any data on the value of tangible assets. Several industries within the major group remain uncovered by any Federal statistical program. They include local transit companies (other than bus companies), taxicabs, schoolbuses, and certain service facilities operated in connection with motor vehicle passenger transportation.

Most elements of motor freight transport and public warehousing are within the scope of one of three Federal reporting programs. The ICC, of course, receives annual reports from most motor carriers in interstate commerce. The bus and truck carrier survey has sampled the remainder of the motor carrier universe. No value data on tangible assets were collected. Public warehousing is within scope of the quinquennial census of business, but no value data on assets are now being collected.

Water carriage is the most poorly covered of the major transportation industries. Only about one-third of the deep-sea carriers report to one of the three regulatory agencies with responsibilities in this area. The agencies include the Federal Maritime Commission, the Interstate Commerce Commission, and the Maritime Administration. Inland water carriers also are inadequately reported. While the ICC does receive reports from some interstate carriers, others are exempt from regulation. There is no coverage of local carriage or shore facilities by any statistical agency.

The interstate character of air travel insures that the bulk of this industry's assets are owned by carriers subject to regulation by the Civil Aeronautics Board. That still leaves a number of contract carriers and intrastate common carriers which do not report financial data to any agency. A similar problem exists with regard to operators of airports and related terminal services.

Interstate common carriers by oil pipeline are regulated by the ICC. Nearly all pipeline companies operate in interstate commerce.

Of the service industries related to transportation, only one—private carlines—owns a significant amount of tangible assets. All lines except those with fewer than 10 cars report to the Interstate Commerce Commission. Coverage of the remaining transportation service industries is uneven. It ranges from good, in the case of stockyards, which are regulated by the Department of Agriculture, to nonexistent in the case of certain other minor industries which are not subject to any Federal reporting programs.

#### CONTENTS OF THE TYPICAL REGULATORY REPORT

Regulatory reports are similar in structure and content. The reports required from the various modes are of one family. The reports filed by water carriers whether to the ICC or one of the maritime agencies share a high number of common schedules. This feature of transportation reporting makes it possible to review data availabilities in terms of a hypothetical general regulatory report. The report discussed will be that used by the larger economic units within a particular industry. Junior reports, which provide less detail than the senior report, are prescribed for smaller economic units in some industries. The effects of differential reporting requirements vary insofar as wealth estimates are concerned. In the case of railroads, they are unimportant since 90 percent of the assets are owned by roads filing the senior report. In

addition, the junior report for railroads is unusually detailed. On the other hand, most truckers file one of two versions of a junior report, the least detailed of which provides no value data on tangible assets.

Three classes of data which relate to wealth estimates are found in the general regulatory report. The first category comes from the balance sheet; the second comes from the income statement; the third class of data describes the physical characteristics of certain properties.

The typical balance sheet has three entries relating to tangibles:

Material and supplies.

Carrier property.

Miscellaneous physical properties.

This early distinction between tangibles used in transportation and those used in other activities is fortunate. A common drawback of company reports from other economic sectors is their failure to relate assets to specific economic activities.

The typical report contains schedules supporting the latter two entries above. Carrier property is spread among a half dozen to four dozen primary accounts. Vehicles are separated from other equipment types. These primary accounts generally provide sufficient asset-type detail for making wealth estimates. There will be minor problems, of course, in translating some primary-account categories into asset-type classes.

With regard to carrier properties, the major deficiencies in the typical report include the lack of value data distributed by the States in which the properties are located; also the lack of value data distributed by the age of the properties. Some basis for the former is needed if there are to be regional wealth estimates; the age distribution of book values is required if book figures are to be converted into present-day dollars.

The schedule supporting the balance sheet account "Miscellaneous physical properties" does not distribute the value by primary accounts. Rather, each property considered as an entity is identified along with the associated book cost. The location of the property is often shown. In preparing wealth estimates it will be necessary to distribute the value of individual properties by their constituent asset classes and to collect values by age.

Information from the income statement and related schedules is necessary since they are the data source for rental payments and receipts. Rental payments in the typical report are classified in three ways. Some payments will be associated with the lease of particular asset types. This is preferable for wealth purposes. Unfortunately, the typical report throws some rental payments into accounts also containing other types of expenses, while other payments are grouped in an all-purpose rent account.

The third category of needed data is the value of assets leased to other sectors, by asset type. The bulk of these assets is recorded in the balance sheet account "Miscellaneous physical properties." As indicated earlier, miscellaneous properties considered to be operating entities usually are identified in a supporting schedule. Typically, the associated revenues (rents) also are shown. Some problem can be anticipated in using these data when they relate to operating entities consisting of more than one asset type, e.g., a business enterprise.

Data relating to the physical characteristics of tangible assets are useful as supplementary measures of wealth. The typical regulatory report contains such data. The focus of these data is on vehicles. At a minimum, simple counts by type are available. Sometimes they are distributed by other characteristics. The reports of some industries (water carriers, for example) require that each vehicle (vessel) and its physical characteristics be enumerated separately.

### COMMUNICATIONS AND PUBLIC UTILITIES <sup>1</sup>

Available data on the utilities sector rank with those for the best reported segments of transportation. The comparability of these data among like companies is unexcelled by any other economic sector. Detailed financial reporting on prescribed forms and according to uniform accounting procedures is characteristic of the utilities sector.

The major sources of data on the sector are the annual reports filed with Federal and, to a much lesser extent, State regulatory agencies. State reports represent a data source for industries not well covered by Federal reporting programs. Fortunately, since many utilities are subject to regulation by both levels of government, there has been a strong tendency to standardize report forms and accounting procedures. Even in the water utility industry, where there is no Federal regulatory interest, many States have adopted uniform accounting systems.

#### REPORTING VEHICLES FOR THE SECTOR

In the paragraphs immediately following, each major industrial component of the utilities sector is discussed with a view to determining whether existing data-collection vehicles provide adequate coverage. Attention is then focused on the adequacy of collected data in terms of the requirements for making wealth estimates.

Ninety-five percent of the tangible assets of the telephone industry are owned by the 75 companies filing reports with the Federal Communications Commission. Several hundred additional companies file less detailed but nevertheless compatible reports with the United States Independent Telephone Association. Over 2,000 other telephone firms with aggregate assets of \$0.5 billion do not report data to either organization. Practically all States regulate telephone service, and most of these require annual reports. Copies of these might be required in the benchmark year. These reports are believed to be compatible with the FCC report.

The telegraph industry is composed of fewer than 12 companies. Each reports to the Federal Communication Commission. Radio and television broadcast service is regulated by the FCC. Each station and network is required to file an annual report. Excluded from the annual report requirement are certain television relay operations. The data provided by broadcasters are not detailed nor are they compiled under uniform systems of account. In these respects, broadcast data compare unfavorably with statistics from most other industries in the utilities sector.

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<sup>1</sup> Throughout this summary, the phrase "utilities sector" will refer to the communications, and electric, gas, and sanitary services industries belonging to major groups 48 and 49 of the Standard Industrial Classification. Companies within a few of these industries, of course, are not commonly categorized as public utilities, e.g., broadcasting.

Data on the assets of practically all investor-owned electric companies are reported to the Federal Power Commission. Nearly all cooperatively owned electric utilities report to the Rural Electrification Administration. Both agencies have prescribed similar systems of account, and their reports are compatible.

Information on slightly more than one-half the assets of the gas industry are contained in annual reports filed with the Federal Power Commission. Gas companies owning the remainder of the industry's tangibles are exempt from Federal reporting requirements. However, most of them voluntarily file data with the American Gas Association; in addition, most of these companies are required to file reports with State commissions. The general compatibility of systems of account and annual report forms among the States has been pointed out.

Privately owned water companies are regulated in about 40 States. At least one-half of them follow the same system of accounts (developed by the National Association of Railroad and Utilities Commissioners) and report comparable data. The significance of the diversities in the data reported by companies in the other States which require reports is not known.

Two of the minor industries in the utilities sector are covered by Federal statistical program. The Public Health Service in cooperation with the States periodically collects data on sewerage systems, including those which are privately owned. Irrigation companies are the subject of a decennial census as part of every second census of agriculture. No value data are collected through either the PHS or Census Bureau programs. The remaining minor industries within the utilities sector (as defined in the Standard Industrial Classification) are not covered by a Federal statistical program. They include communication services, not elsewhere classified (4899); combination companies and systems, not elsewhere classified (4939); refuse systems (4953); sanitary services, not elsewhere classified (4959); and steam supply (4961).

#### ADEQUACY OF REGULATORY REPORTS

Considerable structural similarity exists among the reports of telephone, telegraph, electric, gas, and some water companies, due to the tendency to standardize accounting procedures. Given this similarity, it is possible to consider the general adequacy of these reports for purposes of wealth estimates by reviewing a constructed composite regulatory report.

The general balance sheet of the composite regulatory report contains three major accounts relating to tangible assets: "Utility plant"; "Nonutility property"; and "Materials and supplies."

The major component of "Utility plant" is "plant in service." The balance in this account is in turn spread among several dozen primary accounts. Each of these refers to specific types of assets; e.g., land, structures, equipment, etc. These asset types are repeated under each of a half-dozen functional groupings. These bring together the land, structures, and equipment (usually spread in turn among specific classes) used by the utility in performing specific major functions; e.g., storage, transmission, distribution, etc. The primary accounts for "plant in service" are in sufficient detail for wealth estimating purposes.

At any point in time, it is possible that some utility plant is not in service. Accounts have been established for these various contingencies. Among them are "completed construction not classified," "plant under construction," and "plant held for future use." Supporting schedules exist for many of these accounts.

Supporting schedules also are to be found in the composite regulatory report for the other two general balance sheet accounts. Each nonutility property of consequence is identified, and its cost is shown. Another schedule distributes the balance in "Materials and supplies" among its various subcategories.

Data available from the composite regulatory report on rental receipts and payments are not satisfactory since it is not usually possible to associate them with particular kinds of rented properties. In the case of certain assets used in utility operation (rented vehicles, business machines, etc.), the composite report groups the rental expenses with nonrental expenses. The major drawback of the data found in the composite regulatory report is that they do not afford a basis for a geographical distribution of tangible assets. (This statement is correct with regard to the report filed with FCC by telephone carriers; however, Bell companies, which account for 85 percent of the industry, furnish FCC a State-by-State property separation in connection with other regulatory requirements.) Of course, this statement applies only to multi-State communication and public utility firms. It will be necessary for multi-State firms to provide data needed for this distribution. The utilities sector will be able to provide these data more efficiently than other industrial sectors. Firms subject to FCC regulation are required to account for substantial portions of their tangibles on a plant-by-plant basis. In addition, the interest of State taxing authorities in utility properties as well as the prevailing pattern of State regulation of intrastate utility activities suggest that State-by-State distributions of tangibles can be prepared readily.

The generally high quality of utility accounting records again will be apparent in the collection (probably on a sample basis) of the age distribution of gross book-value data required in the revaluation effort. The annual regulatory reports, of course, do not provide such data. The special reports filed by Bell companies with the FCC (referred to above) provide the required information for that segment of the telephone industry.

#### TRADE

A review of existing data shows there is more complete information on inventories than for fixed tangible assets owned by the wholesale and retail trades. Major gaps or deficiencies on existing data may be listed as follows:

1. Inadequate information on an establishment basis. Even the available inventory data are, in many cases, on a company basis.
2. Inadequate breakdowns of depreciable assets by asset type. IRS and Census data refer to total depreciable assets.
3. Variations and inconsistencies in valuation methods. While these can never be overcome completely, a wealth inventory can impose more order on the figures than now exists.

4. Little or no information about physical-asset units, except for data on square footage of wholesale trade establishments.

5. Little or no information about wealth owned by other sectors but used in trade. The relatively high ratio of leased-to-owned capital in trade makes data on a use basis particularly valuable.

The major data collection programs in the trade sector are conducted by the Census Bureau and the Internal Revenue Service. Their chief similarity is their scale: each program has periodic contact with every economic unit within the sector. Major dissimilarities arise with respect to the kind of information collected, the frequency of collection, and the definition of the reporting economic unit.

The IRS statistical program compiles information from annual tax returns filed by corporations, partnerships, and sole proprietorships. These economic units may engage in more than one activity (sole proprietors are supposed to file a separate schedule for each activity) and operate in more than one location. Each unit, regardless of form of organization, reports total inventories. Corporations and some partnerships, but not sole proprietorships, file balance sheets showing values for land and depreciable assets, the latter on both gross and net bases.

The shortcomings of the IRS data are clear after the foregoing recitation of their characteristics. The depreciable assets are not distributed by asset type nor, in the case of multi-industry companies, related to each industrial activity, although most trade companies are highly specialized industrially. The location of tangible assets is not shown, although it can be inferred from the address of the taxpayer. While the inferred area of location would be correct for most trade firms operating only one establishment, it clearly would be incorrect in situations involving the larger multi-establishment companies.

The major relevant program of the Census Bureau is the quinquennial census of business which collects data from every trade establishment. At present, however, only the questionnaires for wholesale establishments are being used to collect data material to wealth estimates, and those data relate only to inventories. Some supplementary physical detail on spatial facilities also is collected from wholesalers through the quinquennial censuses. The advantages of utilizing an establishment-level program for the collection of required wealth data include the provision of more homogeneous data for kind-of-business analysis and of data by geographic location, although the latter detail considerably increases costs.

Two other Census programs provide some wealth-related data. The annual retail trade report shows the cost value of year-end inventories for two- and some three- and four-digit industries. Data are obtained from a probability sample of establishments, with total coverage of those belonging to large multi-unit companies. The latter report inventories on a company basis.

The 1963 census company summary form (described in ch. 10 in connection with the manufacturing sector) is also being sent to about 1,500 large multi-unit wholesale and retail companies. The company form will collect inventory figures, as well as data on gross and net depreciable assets. The assets of multi-unit trade companies engaging

in only one industrial activity might be allocated by establishment, using sales or some other weighting factor.

There also are a number of minor statistical programs which provide information on trade. The Harvard Business School has collected average inventory turnover-rate data for some classes of retailers. (The maintenance of these series is being transferred to other institutions.) Annual ratios published by Dun's Review relate inventories to various balance sheet and income statement items. The "Statement Studies" of Robert Morris Associates present data on inventories and the net fixed assets of a nonrandom sample of 9,000 retail and wholesale firms distributed among several dozen lines of trade. The usefulness of these programs is limited. At best, the data collected might serve as rough consistency checks.

### FINANCE, INSURANCE, AND REAL ESTATE

Existing wealth-related data on the finance, insurance, and real estate (FIRE) sector are unsatisfactory in many respects. There are limited possibilities for improvement of these data through the single reporting program which covers the sector in its entirety.

#### SCOPE OF THE SECTOR AND MAJOR ASSET

The FIRE sector is composed of the following eight SIC major groups.

<i>Title</i>	<i>Major group No.</i>
Banking-----	60
Credit agencies other than banks-----	61
Security and commodity brokers, dealers, exchanges, and services-----	62
Insurance carriers-----	63
Insurance agents, brokers, and service-----	64
Real estate-----	65
Combinations of real estate, insurance loans, law offices-----	66
Holding and other investment companies-----	67

The major component of the sector's tangible assets is the rental property reported by individual taxpayers on IRS form 1040. The next largest component is reported by corporations, partnerships, and sole proprietorships classified within real estate, major group 65. Less than 10 percent of the sector's tangible wealth is owned by the remaining SIC major groups. Even within these, real estate is the most important type of tangible asset.

#### STATISTICAL COVERAGE

The Internal Revenue Service is the only current source of wealth-related data for the FIRE sector as a whole. A few alternative data-collection vehicles exist for various parts of the sector through the statistical programs of other Federal agencies and the State insurance commissions. However, these alternatives cover industries owning only a small part of the sector's tangible assets. These statistical programs are operated by Federal and State supervisory agencies. These agencies and the SIC major groups (or industries) which are supervised include the following:



Banking is covered in large part through reports filed with the Federal Reserve banks, Federal Deposit Insurance Corporation, and Treasury Department. Some of the other credit agencies are supervised by the Federal Home Loan Bank Board (savings and loan associations), Farm Credit Administration (agricultural credit institutions), and the Bureau of Federal Credit Unions. The Securities and Exchange Commission and Commodity Exchange Authority receive statements from brokers. Insurance carriers are required to file reports with the States in which they operate. These firms also file a copy of their report with the IRS along with the tax return. Lessors of railroad property (classified within major group 65, real estate) are regulated by the Interstate Commerce Commission.

The reports of banks, other credit agencies, and insurance carriers are similar in some respects. The balance sheets which they file separate the value of occupied premises from that of other real estate. Furniture, fixtures, and equipment are grouped into a third account. Emphasis in the balance sheet is on book or current values. Original or acquisition costs (before depreciation and other adjustments) either are not reported or are shown in supplementary schedules. The publicly reported information from banking and other credit agencies will have to be supplemented by additional data, some of which could be obtained from supervisory-agency examination reports. The location of tangible assets must be determined. Acquisition or original costs must be linked with acquisition dates or periods in order to prepare estimates of gross reproduction cost. Physical detail on real estate is desirable as an adjunct to the value estimates.

The insurance carrier reports to State commissions appear to provide data needed for revaluation but none on the physical characteristics of the real estate holdings.

The nonstandardized statements presently filed by securities and commodity brokers do not focus on tangible assets. These business units could complete a special schedule on tangibles in the benchmark year as part of their annual report to the supervisory agency.

The reports of railroad lessors to the ICC are in considerable detail and parallel those of operating railroads. The adequacy of these reports is considered in a section of the transportation sector review.

The Internal Revenue Service, the only data source for the bulk of the FIRE sector's tangibles, currently receives balance sheets from corporations and many partnerships. Gross values are reported on the tax form for land, depreciables, and depletable assets. Claimed depreciation is supported by a schedule calling for information on the kind of property, date of acquisition, and cost. However, experience with this schedule shows that there is wide variation in the way in which it is completed and that because of this, it will not provide data needed for revaluation.

The tax form falls short in other vital aspects. It does not relate assets to activities, a necessary distinction in the case of multi-industry companies; but fortunately the multi-industry enterprise is less prevalent in the FIRE sector than in most others. The location of the assets of multistate business units is not shown. Finally, the tax form provides no supplementary physical detail on tangible assets. It is possible that some of the information required from corporations and, perhaps, partnerships could be collected appropriately by the tax agency

through a special program using a sample of reporting firms. On the other hand, since other required information is clearly irrelevant to the tax-collection function, it may be necessary to institute a census (or survey) designed to serve wealth needs.

The tangible assets of sole proprietorships classified in the FIRE sector and the rental properties of individuals (these last being the largest component of FIRE wealth) create much less problem than the wealth of FIRE corporations and partnerships. Data from individuals concerning their holdings of business property would be collected through the survey of household wealth discussed earlier in chapter 9.

### SERVICES

The scope of concern of the working group on wealth in the service industries is broad and encompasses heterogeneous subsectors. In terms of the SIC numerical coding system, it includes all major groups beginning with 7 or 8 except SIC 88, households. Among the major groups are all private nonprofit and many profitmaking industries.

Because of the absence of data, it is difficult to assess the importance of the services sector as a whole and of its various parts. The data which are available are summarized in table 9. The footnotes to the table serve to point up limitations of the data.

TABLE 9.—*Wealth estimates for the various service subsectors*

[Billions of dollars]

1. Profitmaking service industry firms—book value of fixed assets and land for firms with fiscal years ending July 1, 1959, to June 30, 1960—	<sup>1</sup> 31.9
2. Hospitals—book value of plant for voluntary and proprietary hospitals at the end of 1962 (excludes equipment)-----	<sup>2</sup> 7.7
3. Institutions of higher education—book value of plant and equipment of private institutions for fiscal years ending during 1960-----	<sup>3</sup> 5.7
4. Labor unions—totals assets, including intangibles at the end of 1960—	<sup>4</sup> 7.7
5. Labor union pension funds—total assets including intangibles at the end of 1960-----	<sup>5</sup> 33.0
6. Religious organizations—book value of religious edifices and parsonages compiled by the 1936 Census of Religious Bodies, plus the sum of construction expenditures from 1937 through 1962 (\$10, 500,000,000)-----	<sup>6</sup> 14.2
7. Charitable foundations—value (mixed market and book) of the tangible and intangible assets based on records available in 1963-----	<sup>7</sup> 14.5

<sup>1</sup> For derivation of this total see table I of app. II, pt. N, Report of the Working Group on Wealth in the Service Industries.

<sup>2</sup> "Journal of the American Hospital Association," Aug. 1, 1963.

<sup>3</sup> "Financial Statistics of Institutions of Higher Education," U.S. Office of Education. An estimate of book value of plant for public institutions, based on the ratio of the number of public to private school buildings of higher educational institutions as of Dec. 31, 1957, is \$7,700,000,000.

<sup>4</sup> "Office of Labor-Management Reports," Department of Labor.

<sup>5</sup> The total assets of religious and charitable institutions are currently estimated at \$54,800,000,000 by the National Conference of Christians and Jews. This figure is up 170 percent from 20 years earlier.

<sup>6</sup> Foundation Library Center, "The Foundation Directory," 1964.

### REVIEW OF EXISTING DATA

Industries within this sector have been regrouped in a limited way in order to improve the significance of data aggregates. The review of data follows the recommended sectoring.

The private profitmaking services subsector includes all organizations existing primarily to make a profit except proprietary hospitals

which are included as a subcategory of all hospitals—profit and non-profit. Data on the profitmaking services industries are available primarily from two sources—the IRS and the census of business. The former source is more comprehensive than the latter. It covers both division 7 and division 8 industries in three-digit details on a company basis, and provides the only direct data on wealth on a wide-scale basis—gross and net book value. The Census Bureau data cover division 7 establishments only and are limited to physical counts of selected tangible assets, such as the number of vehicles owned and leased by laundry and cleaning establishments. Also, capital expenditures data have been collected on a sample basis for census years.

Data for the hospital subsector are collected by the American Hospital Association. These data include plant plus reserves for future buildings minus depreciation at book value, physical inventories for beds and certain other facilities, and the book value of financial assets, broken down for proprietary, private nonprofit, and government hospitals. Private nonprofit and, of course, proprietary hospitals are required to file tax returns with IRS.

For the private nonprofit education subsector (including libraries and nonprofit educational and scientific research organizations), the only comprehensive data available are those for higher educational institutions. These data were collected by the U.S. Office of Education in connection with a study to be published under the title "Inventory of College and University Physical Facilities, December 31, 1957," part 3 of the five-part "College and University Facilities Survey." The data, coded and edited for transfer to IBM cards, include information on plant-fund investment at historical cost, geographical detail by State, date of original occupancy and rehabilitation (if any), type of construction, number, condition, and size of buildings, and the estimated current value of the facilities. Data on the book value of plant and changes therein are collected biennially for another Office of Education report, "Financial Statistics of Institutions of Higher Education." Apart from these data on higher educational institutions, some limited information, useful primarily as a register, is found in the American Council on Education's "American Junior Colleges" and the "Porter Sargeant Handbook" which covers private elementary and secondary schools. The only comprehensive data for these schools were collected as part of a 1962 Office of Emergency Planning inventory of instructional rooms in school plants. It is understood that religious bodies have summary data on the schools which they operate.

Only fragmentary data exist for museums, art galleries, and botanical and zoological gardens. The data consist of responses to about 3,000 of over 6,000 questionnaires sent out by the American Museum Association. The survey included questions relating to square feet of floor space, the cost per cubic foot, and type of construction of new additions. Museums are required to file balance sheets with IRS.

Since 1960, labor unions and labor union pension funds have been required to file asset reports with the Office of Labor-Management Reports of the Department of Labor. Labor unions with annual receipts of \$30,000 or more report book values for land by specific location, buildings by specific location, automotive equipment, office furniture

and equipment, other fixed assets and depreciation. Pension funds report the book value of operated real estate, and other fixed assets. Totals for each of the subcategories of fixed assets have not yet been tabulated but will be shortly. Both labor unions and their pension funds are required to file balance sheets with IRS.

Data on religious bodies have been lacking since the last census of religious bodies was taken by the Census Bureau in 1936. The National Council of Churches of Christ in the U.S.A., publishes "The Yearbook of American Churches," which contains a presumably exhaustive list of religious bodies.

Charitable organizations fall into two major classes—foundations usually established by one or a group of persons, and charities supported by some level of government or by the general public. The only basic data source on the former is "The Foundation Directory." It is compiled by the Foundation Library Center from IRS figures and those provided directly by the foundations. No data are systematically reported for charities supported by government or the general public. Fragmentary data may be available from annual reports of the various charities and from financial data they are required to file to achieve participation in local community fundraising drives.

No data are available for miscellaneous nonprofit organizations. The sector is composed mainly of business, professional, social, fraternal, political and civic membership organizations. Each of these except fraternal organizations is supposed to file balance sheets with IRS.

#### DATA OBJECTIVES AND PRIORITIES

Because of the many different components of the services sector and the lack of data for many of them, priorities have been recommended for achieving the overall goals of the wealth inventory. These priorities follow in order of their importance:

- (a) Total wealth broken down into the private and nonprofit sector on both ownership and use basis, the latter being of particular interest since asset leasing is extremely important in many service industries;
- (b) A breakdown of both of these two totals into land, structures, equipment and inventories;
- (c) Industry detail to the greatest extent possible;
- (d) Regional detail on a four- or nine-region basis;
- (e) Asset-size detail for selected industries.

To obtain these goals, much more comprehensive coverage of certain industries is required. IRS data should be used to the greatest extent possible. Special attention should be given to determining exactly what IRS data are available for nonprofit institutions and tabulations should be made wherever appropriate. The assistance of the Library Foundation Center and the United Community Funds and Councils of America should be sought in order to fill gaps and supplement IRS totals on charitable foundations, and charities supported by the general public, respectively. If IRS data are not available for museums, art galleries, and botanical and zoological gardens, the American Association of Museums should be encouraged to collect such data. The Office of Education should obtain gross

book-value data for private elementary and secondary schools and junior colleges, thus extending the scope of its wealth data coverage, currently limited to institutions of higher education. The Census Bureau should be authorized to resume the census of religious bodies, but past breakdowns by religious sect are not necessary for wealth estimates. All nonprofit organizations not classified elsewhere, such as fraternal organizations and athletic clubs, should be the responsibility of the Census Bureau, if they are not required to report to IRS.

The data-collection efforts in the service sectors, as described above, require coordination which should be provided by the Census Bureau.

## CHAPTER 12

### SUMMARY GUIDELINES

In its "Foreword" to this report, the Advisory Committee to the Wealth Inventory Planning Study has called attention to the existence of serious gaps in the basic data on both tangible wealth and financial claims, as documented in chapters 8 through 11. It has underscored the general advances in economic understanding and various specific uses that would flow from more comprehensive and detailed data and estimates of wealth, drawing from the discussion in chapter 1 and appendix I, part A.

The Committee has gone on to call for improvement and expansion in the collection of wealth data by the appropriate Federal statistical agencies as a basis for more adequate estimates of tangible wealth, by industry, and of national balance sheets, by sector. Recognizing that this report could not, and was not designed to, blueprint asset schedules to add to existing statistical programs, the Advisory Committee has suggested certain further procedural and substantive steps within the Federal statistical establishment to make this possible, if the necessary congressional support is obtained. In particular, leadership by the Office of Statistical Standards in the Budget Bureau will be needed to mobilize and coordinate planning efforts of the various Federal statistical agencies concerned.

Although not definitive, we believe that the staff report does provide a consistent and integrated framework for approaching most of the main conceptual and statistical problems posed by the processes of wealth data collection and estimation. When suggested solutions are not sufficiently specified, they will at least serve as a point of departure for further discussion and exploration within the various data-collecting and estimating agencies.

As an aid to further work, in this concluding chapter we provide an outline summary of: (A) general guidelines with respect to (1) tangible wealth data and estimates, (2) balance sheet data and estimates, and (3) the valuation of both tangible and financial assets; and (B) a summary of the agencies and reporting programs which appear to be logical vehicles for the wealth inventories in the various sector and industry groups of the economy. This is in line with the Advisory Committee recommendation that the wealth data be collected as far as possible by utilization of existing programs. Insofar as the general guidelines may not apply to particular sectors, the reader must go to the sector working group reports for specific recommendations, which we have not attempted to summarize other than by implication in chapters 9 through 11.

## GENERAL GUIDELINES

This section summarizes the discussion in the report in terms of general guidelines for treatment of the major conceptual and statistical problems met in collecting wealth data and preparing wealth and balance sheet estimates. These may, of course, be modified in the course of the further planning work in the Federal statistical establishment.

1. *Tangible wealth data and estimates.*—To be complete, tangible wealth estimates should include both reproducibles and nonreproducibles. Because of special difficulties in estimating values of the latter category which comprises land, depletable natural resources, and collections of manmade nonreproducibles (such as art), top priority should be given to completing plans for collection of data on the reproducibles while advancing study of the special problems posed by nonreproducibles.

(a) Wealth data should be collected for each industry on an establishment basis wherever feasible, in general conformity with the "Standard Industrial Classification Manual" and thus with the OBE industry groupings. While not ideal, this is the best practicable approach for most purposes of tangible wealth analysis.

i. If the SIC manual of 1957 as amended is to be reviewed and revised, this should be done, if possible, prior to the beginning of the wealth inventory cycle. This in line with the recommendation of the Technical Committee on Standard Industrial Classification to the Bureau of the Budget for a revision approximately every 10 years. Changes appear necessary, for example, in the agricultural services industries, and in the classification of leasing companies. Because of the overriding value of temporal continuity in economic data, however, changes should be made only when essential, and so as to preserve continuity at the highest possible level of detail.

ii. Across-the-board wealth data, when collected on an establishment basis should be coded and tabulated in four-digit industry detail. OBE estimates are generally published in no more than 2 digit industry detail, but consideration should be given by OBE to three-digit detail for the benchmark year, since the efficiency of users in handling large bodies of statistics has increased greatly in recent years. Wealth data and estimates for governments should be classified in terms of the functional classes developed by the Bureau of the Budget, as well as by agency.

(b) In the basic data collections or surveys, data should be obtained for the broad classes of wealth: land and other natural resources; buildings and other structures; machinery and equipment; and inventories; and within each of these by such major categories as tests indicate can be obtained across the board. These categories should be consistent with the categories of new investment contained in the national product.

(c) For small samples in each industry, data on structures and equipment stocks should be gotten in extensive detail, and by year or period of acquisition, for use in developing estimates of de-

preciated replacement cost, as well as for analytical interest in the age-structure of capital stocks, by type. Pilot studies will be needed to determine the sorts of basic equipment records and property accounts maintained for establishments. Seven-digit census commodity-classification detail in important and clearly defined types of equipment may serve as a point of departure for discussion between agency and industry representatives in developing classification lists and codes for use by respondents in reporting stocks, if the pilot studies prove this feasible.

(d) We note the recommendations of certain working groups who, in order to study specific functions across the economy as well as in given industries, wish to have all industries report on their holdings of the following types of equipment: transportation, communications, construction, water processing, sewage treatment, and power generating.

(e) Geographical detail for the establishment data should be published for States and major SMSA's. In addition, when data are identified on a county basis, they should be preserved in such geographic detail on tapes or in basic records for those who wish to use them for analysis, or as a basis for allocating broader data to narrower regional groupings. When sample surveys are used, they should be designed where possible to provide estimates for States and the larger SMSA's.

(f) Data on assets must be collected from owners, but we recommend that such data also be published on an industry of use basis by reallocating the estimated value of leased assets to the user industry, for purposes of capital-output analysis. To accomplish this, data on rentals paid, by at least broad types of assets, should be obtained from users, while rentals received and the corresponding value of assets by the same types, should be reported by owners.

2. *Structure of the national balance sheets.*—The OBE and the Division of Research and Statistics of the FRB should jointly review the structure of an integrated set of national and sector appropriation and saving-investment accounts, and the related balance sheets. These agencies should then recommend to the Office of Statistical Standards the sector and item specification for basic data collections. In the meantime, the following guidelines emerged from Wealth Study discussion.

(a) *Sectoring of financial data.*—A number of changes and elaborations of the sectoring used in the Federal Reserve Board's flow of funds accounts and partial balance sheets appear desirable, as the availability of the required data permit, during the estimation phase of the wealth inventory.

i. In the household sector (consumers and nonprofit organizations), personal trust funds and private nonprofit organizations should be shifted out, and separate estimates provided for the farm household subsector. Consideration should also be given to distinguishing other subsectors, as by asset-size class, at least on an occasional basis.

ii. In the nonfinancial business sector, subsectors for broad industry groups (of companies) should be established to permit analysis of differences in financial patterns. For the



most part, breaks by two-digit SIC industries or combinations thereof would be sufficient. (See exhibit C in app. II, pt. O.)

iii. In the financial business sector, some additional subsectoring would be desirable, in view of the concentration of financial assets in this area. The suggested breaks come largely in the finance company subsector. The subsector for personal trusts would be added.

iv. A sector for nonprofit institutions should be added, and consideration given to providing subsectors for hospitals; educational institutions; museums, art galleries, and gardens; nonprofit membership organizations; charitable foundations; and charities supported by the public.

v. In both the Federal, and State and local governments sectors, corporations, and other government enterprises should be shown separately by major industry groupings. State and local governments should be split into separate sectors.

(b) *Asset types*.—Further detail on the various types of financial claims is desirable, above that which is currently available in the FRB flow of funds. The objectives of such detail are to provide data on all important types of claims and to minimize the size of the "all other" category. While some detail is generally applicable to the economy as a whole, claims categories must be tailored to suit particular sectors whenever necessary.

i. Cash should be separated from demand deposits to provide a clean total for the latter.

ii. Other noncurrent assets, deferred charges, and prepayments should be shown separately.

iii. Greater detail on short-term liabilities is required.

iv. Claims between parent companies and their nonconsolidated domestic subsidiaries, foreign branches, subsidiaries and affiliates, and other foreigners should be shown separately.

v. All claims should be broken down into the following maturity classes to permit analysis of liquidity: original maturity or due dates of 1 year or less, and claims with maturities of more than 1 year.

(c) *Company versus establishment detail*.—For purposes of revaluing the tangible assets of industries of companies, the Census-IRS "link project" should be continued on a recurring basis. By tabulating Census data for matched corporations, classified by IRS industries, but distributed by four-digit Census industries, the link tables make possible more detailed and accurate revaluation of company-industry aggregates by appropriate weighting of the refactors developed for the more detailed industry-of-establishments data.

3. *Valuation*.—Asset data should be collected in terms of actual or estimated market values where feasible, in addition to the usually available book values, plus related data which will make it possible for the estimating agency to develop approximations to market values. The market value approach is consistent with valuations used in the national income and product accounts. It is necessary as a basis for

meaningful comparisons among sectors, regions, and nations (when adjusted for differences in the purchasing power of currencies), and for historical comparisons of tangible wealth (when current values are deflated to common base-period prices). The problems in applying the general principle differ among the major asset categories.

(a) *Depreciable assets*.—Estimates of both gross replacement value and net replacement or market value should be prepared, if feasible. Gross values are believed to be more closely associated with output; net values, with capital compensation. For some assets with active secondhand markets, such as houses, automobiles, and selected consumer durables, agricultural equipment, and a few other producers durables, respondents should be asked for estimated market value and/or the estimating agency can apply average prices to physical units by age classes. For the other assets, gross book values by sector and industry should be broken down into asset types, by year or period of acquisition, based on small-sample distributions, unless broader data are available. Each period's surviving acquisitions should then be revalued by appropriate composite length-of-life data and depreciation curves. These indirect procedures call for improvement in the associated data required for such estimation.

i. Capital goods price indexes need to be improved and broadened in coverage for purposes of revaluation and deflation. The machinery and equipment prices in the BLS wholesale price index need to be supplemented in the areas showing low coverage such as special industry machinery (see app. I, pt. J, table 1), where these are not available from other sources (as in the case of much transportation equipment). Further thought and effort needs to be devoted to improving the construction cost indexes now used by OBE for deflating the various types of new construction activity, with particular regard to modifying those that do not now reflect changes in productivity in the construction industry. Where new capital goods prices indexes are developed, attempts should be made to extend these back in time for at least several years.

ii. Additional data should be collected on lengths of life of depreciable assets. This could be accomplished in connection with the sample industry surveys of period of acquisition of surviving assets if data on previous periods' capital outlays by the same classes were also collected. Or special surveys of discards, by type of asset, by age, in the prior year could be conducted. For some types of equipment, such as automobiles, trucks, tractors, and selected equipment in the regulated industries, existing physical unit data by age classes in conjunction with prior year's acquisitions permit computation of survival curves.

iii. Further studies of the type made by the Machinery and Allied Products Institute are needed of the patterns of depreciation as durable goods age. Collection and assembly of data on used equipment prices by type, by age, where organized markets exist are the basis for such studies. Due to the lack of organized markets for many types of durables, imputation of depreciation curves is inevitable.

iv. If collection of gross book-value data by period of acquisition proves not to be feasible in some industries, past capital outlay data can be used to construct rough age distributions of current book value for purposes of revaluation. This suggests the desirability of improving capital expenditure data with particular regard to obtaining more detail by industry and type for certain sectors.

(b) *Inventories*.—In order to revalue more precisely the reported book values of inventories, the Census and other agency sources of basic data should obtain additional information from a small sample of respondents on type of accounting method used, particularly with respect to the use of LIFO-type methods; and additional detail on the product composition of inventories, where significant, particularly at the purchased materials stage.

(c) *Land and natural resources*.—In general, private owners of land and other natural resources should be asked to estimate their current market values. For public lands not now estimated at market value, regional appraisal boards should be set up to establish “shadow prices” using general guidelines formulated to insure comparability of method. Procedures would be similar to those now used to estimate the current values of over four-fifths of the Federal public lands (public domain and donated lands)—reference to sales prices of similar private lands, capitalization of projected net income, and appraisals. It would be very useful in extending estimates, and for revaluations, to have official price indexes for major types of nonagricultural land by regions. Nothing exists in this area now except price indexes for major types of agricultural land, by region, which are used widely.

(d) *Financial assets*.—In general, financial assets for which there are markets should be revalued. This is particularly important for long-term assets, while little distortion would be introduced by carrying short-term assets at book. Alternative total asset valuations for private firms should be estimated by adding to the financial liabilities (at book) the market value of equity. The difference between the going-concern value of firms and the sum of the values of component assets would be shown separately on national and sector balance sheets. The comparative levels and fluctuations in these differences may have considerable significance in economic analysis. (See app. I, pt. H.)

(e) *Revaluations*.—Estimates of changes in valuation (including depreciation) of sector and national balance sheet items should be calculated from one date to another, since new investment and revaluation together account for the total change in assets. Between benchmark wealth inventories, the cumulation of new investment plus revaluations would be the chief approach to estimating yearend balance sheets. This underscores the need for improving the price indexes of both capital goods and other assets, and the gross capital outlay and the depreciation estimates, mentioned above.

## SECTOR RECOMMENDATIONS

The following agencies and reporting programs appear to be logical vehicles for the wealth inventories in the various sectors and industry groups of the economy. Brief notes are given to indicate major features of the reporting programs required to obtain the necessary data, and new reporting programs or extensions of the existing ones which seem to be required for areas presently uncovered.

One general point, which does not stand out in the summaries, should be made here. Internal Revenue Service records will serve two important purposes. One is as the source of "universe" mailing lists for industries not now covered by reporting programs. Second, the IRS tax returns will provide the benchmark or control totals for a large part of the small-establishment universe. These are the totals which would serve as the bases to be adjusted by the results of the sample surveys obtaining the more detailed distributions referred to above.

The following notes are brief since the general guidelines of section (A) will apply. The reader may consult the sector working group reports for detailed discussions and recommendations.

### *1. Federal Government*

The General Services Administration should inventory all tangible assets of the Federal Government, at least on a one-time basis for some major types, thus augmenting its current program for real property. The Treasury should continue its collection of data on the financial claims of the Federal Government, domestic and foreign, and broaden its coverage of short-term liabilities. The Departments of Agriculture and Interior should continue to have primary responsibility for developing data on federally owned natural resources.

### *2. State and local government*

In those areas not currently covered by the Census Bureau or other agencies, such as the Office of Education and the Bureau of Public Roads, the Census Bureau's census of governments should be expanded to cover tangibles as well as financial items. The direction of the expansion rests heavily on badly needed pilot studies to determine the data on reproducible tangibles and natural resources available from State and local government records.

### *3. Households*

Samples of households drawn from the 1970 Census of Housing, conducted by the Census Bureau should be used to obtain data on the major classes of household assets. Data on farm households could be collected along with those on farms generally in the census of agriculture. The survey should include financial assets of sole proprietors (to be broken out later where business assets can be clearly identified) and householders' foreign claims, to the extent that data on foreign income reported to the Internal Revenue Service cannot be used.

### *4. Agriculture*

The Census Bureau's quinquennial census of agriculture is the appropriate vehicle for tangible asset data, with current extensions provided by the Department of Agriculture's crop reporter estimates and other sample surveys. It is recommended that in the 1969 census the inventory of farm machinery and equipment be expanded (with

possible farmer estimates of value), acreage and value-per-acre data to be gotten by type of land, all data by size-class of farm, and the census extended to cover agricultural services. The Agriculture Department's "Balance Sheet of Agriculture" should be coordinated with the national income and product framework.

#### *5. Financial claims, domestic and foreign, of nonfarm corporations and partnerships*

Either through a special balance sheet for the year selected for the financial claims census or through additions to existing forms, the IRS should conduct a balance sheet inventory, obtaining beginning- and end-of-year totals. Data on the flows associated with foreign claims for the inventory year should also be obtained to provide data for the balance of payments. The direct investment surveys of the Balance of Payments Division of the Office of Business Economics should be continued. A special survey is needed to cover claims of foreigners which are in the form of unregistered securities or securities held in the names of domestic nominees.

#### *6. Forestry*

The basic data needed to estimate the value of timber resources can be obtained by expanding the data collected in the periodic survey conducted by the U.S. Forest Service of the Department of Agriculture.

#### *7. Fisheries*

For commercial fisheries, data on assets are being obtained by the Census Bureau for the Bureau of Commercial Fisheries for the first time in 1964; this program should be continued. The Department of Interior's Bureau of Sports Fisheries and Wildlife, in cooperation with State fish and game agencies, should conduct studies of hunting and fishing to determine a basis for valuing fish and wildlife and the data needed to accomplish the valuation.

#### *8. Mining*

The various censuses of mineral industries conducted by the Bureau should be used to obtain required data on privately owned mineral resources and the tangible reproducibles separably and inseparably associated with them.

#### *9. Construction*

Collection of needed information on contract construction should be accomplished as part of a census of construction which should be resumed. This proposed Census Bureau program should provide data related to both wealth and flows. Together with similar information on noncontract construction and construction-related activities, collected with data from the various industries in which these activities occur, a census would provide an urgently needed, comprehensive picture of construction in the U.S. economy.

#### *10. Manufacturing*

The data collection framework used by the Census Bureau in the census of manufactures, the annual survey of manufactures, and enterprise statistics is appropriate for the collection of data on manufacturing wealth, on an establishment basis for manufacturing facilities, and on a company basis for manufacturers' central offices, auxiliaries, and other nonmanufacturing establishments.

### 11. *Transportation*

The major sources of wealth data on the transportation sector should continue to be the annual reports filed with Federal regulatory agencies. However, where there is no regulatory responsibility there often is no statistical coverage. Each major element of transportation is reviewed below and statistical gaps are pointed out. In general, extension of coverage should be provided through new Census Bureau programs.

(a) Each business unit within railroad transportation reports to the Interstate Commerce Commission.

(b) Highway passenger carriers are covered in part by the ICC and the census of transportation surveys. Taxicabs, school-buses, and service facilities related to highway passenger transportation are not covered. The same holds true for local transit companies, other than bus companies.

(c) Most elements of motor freight transport and public warehousing report to the ICC or the Census Bureau's business or transportation censuses. Missing segments to be covered include service facilities relating to highway freight carriage.

(d) Water transportation and related services are covered only in part by ICC, Federal Maritime Commission, and Maritime Administration programs. Major gaps that must be filled exist in connection with deep-sea and inland carriers; also local water transportation and services ashore.

(e) Most of the air carriers are covered through Civil Aeronautics Board reporting.

(f) The ICC receives reports from most oil pipeline companies. No reports are filed by the comparatively few intrastate pipelines, which should be required to do so for 1 year.

(g) Private carlines report to the ICC as do some freight forwarders. Other forwarders report to CAB. Some forwarders are not regulated by either agency and must be covered. Stockyard operators file data with the Department of Agriculture. No statistical program exists for the five remaining transportation services industries. Each is relatively unimportant, but thought should be given to possible coverage, possibly by the census of business.

### 12. *Communications and public utilities*

The great bulk of the communications and public utilities industries should continue to report on the forms filed with regulatory agencies, and in some cases, trade associations. These are reviewed below. To achieve total coverage of an industry may require the use of reports filed with more than one organization; however, reports are generally compatible. Provision will have to be made for industries not covered by any reporting vehicle. In general, the wealth data reported to regulatory agencies are relatively good.

(a) Communications industries will continue to be covered by the Federal Communications Commission, State regulatory agencies, and the United States Independent Telephone Association. Not reporting to any of these are "relay" broadcasters who might be required to report to the FCC in the inventory year. Coverage must also be provided for a few not-elsewhere-classified communications firms.

(b) Electric utilities are substantially covered by the Federal Power Commission and the Rural Electrification Administration.

(c) Nearly total coverage of the gas industry is achieved by the American Gas Association statistical program. More detailed information on gas companies is found in reports to the FPC and the various State regulatory agencies.

(d) Four-fifths of the States require reports from water utilities and provision should be made to assemble these in the inventory years. The Public Health Service receives periodic reports from water and sewerage companies; no wealth-related data are now collected but could be required for the key year. Irrigation systems are covered by every other census of agriculture.

(e) No reporting vehicle exists for refuse companies, certain not-elsewhere-classified sanitary service firms, and steam supply companies. Thought must be given to their possible coverage.

### *13. Trade*

The quinquennial census of business is the logical data collection vehicle for the retail and wholesale trade sectors. The scope of the current questionnaire will need to be broadened considerably at least on a sample basis to cover all large firms and a representative selection of smaller ones, since very limited data on wealth are now collected through this Census Bureau program.

### *14. Finance, insurance, and real estate*

An early evaluation of the usefulness of Internal Revenue Service data derived from tax returns is required in connection with estimating wealth in this sector. Other statistical programs cover most of the banking and insurance industries, but these account for the minor part of the sector's tangible wealth. The present IRS program could be supplemented to cover the real estate industries. The other industries are covered by the programs of the Federal Reserve Board, Federal Deposit Insurance Corporation, the Treasury Department (for banking); Federal Home Loan Bank Board, Farm Credit Administration, Bureau of Federal Credit Unions (HEW) (for other credit institutions); and the Commodity Exchange Authority (USDA) and Securities and Exchange Commission (for most brokers). The scope of information on tangibles will have to be extended somewhat for the inventory year. Coverage of the insurance industries is provided through the reports required by State insurance commissions, which could be supplemented and assembled (possibly through the insurance associations) for the inventory year.

### *15. Services*

The many gaps in existing data for the service industries should be covered by the IRS to the extent possible. The Office of Education and American Hospital Association should expand and/or initiate data-collection efforts in their areas. The Census Bureau should resume its census of religious bodies and assume responsibility for overall coordination of the entire sector. The Foundation Library Center, United Community Funds and Councils of America, and the American Museum Association should be looked to if IRS data prove inadequate in these areas.

This partial summary of the sector working group recommendations from appendix section II again underscores two basic points made earlier: (1) the need for further work in developing and testing wealth-data collection plans by the various statistical agencies named here; and (2) the need for leadership and coordination in this endeavor by the Office of Statistical Standards, with advice from those agencies charged with responsibility for preparation of comprehensive wealth estimates for the United States.



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APPENDIX I

TEN BACKGROUND PAPERS

- A. Uses of Wealth Estimates
- B. Historical Censuses and Estimates of Wealth in the United States
- C. National Wealth Measurement in Canada
- D. The Soviet Capital Stock Inventory and Revaluation
- E. Wealth Surveys in Japan
- F. Relationship of Balance Sheets and Wealth Estimates to National Income Accounts
- G. Notes on Measuring Capacity by Census Enumeration
- H. The Measurement of Capital
- J. Capital Goods Pricing
- K. Some Problems in the Estimation of Service Lives of Fixed Capital Assets

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APPENDIX I: PART A  
USES OF WEALTH ESTIMATES

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## USES OF WEALTH ESTIMATES

As background for the general discussion on uses of wealth estimates in chapter 2, the Wealth Study staff requested several economists connected with organizations which are among the major current or prospective users of wealth estimates to indicate their interest in this type of economic statistics. Specifically, the economists were asked to comment either briefly or in some detail on the following points:

- (1) specific uses your organization makes of existing wealth estimates;
- (2) potential uses you would have if the wealth estimates were improved and elaborated;
- (3) other uses you consider to be of importance; and
- (4) the directions in which you think the improvements and elaborations should go—as toward greater accuracy of aggregates; more detail on type of asset, industry, or region, etc.

The replies are reproduced in this appendix as a supplement to the more abstract treatment in chapter 2. It should be understood that the views expressed are those of the individuals and do not necessarily reflect the views of the organizations with which they are connected. Further, their response to this inquiry should in no way be construed as constituting an endorsement of the proposals contained in the report of the Wealth Inventory Planning Study. Nonetheless, they will be of considerable interest and value to those who are working toward better wealth data.

It will be noted that replies have been obtained from persons connected with one or more organizations in each of the major sectors of the economy: business, labor, government, and private nonprofit research organizations. They are presented in that order.

### 1. STATEMENT BY EMERSON P. SCHMIDT, ECONOMIC CONSULTANT, CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA

Only actual experience with periodic wealth inventories would reveal the inevitable numerous uses of such data.

The Chamber of Commerce of the United States issues materials from time to time including estimates of investment per job. It has made several such surveys. It receives many requests for such information. While fairly precise information is available for some industries, overall figures are inadequate and it would be useful to have accurate information, say on a quinquennial basis.

Producers or users of such data generally fail to indicate whether original cost, depreciated original cost, or current replacement cost, is being quoted and used. Since business planning is by definition forward looking, it would be particularly helpful to have detailed data on investment per job in terms of current costs. Industry (or possibly product) breakdowns as well as regional data would be of interest to the national chamber and its members.

Because of the enormous changes in technology and the nature of capital equipment, dollar inventory data should be supplemented by data on performance or capacity. The run-up in BLS reported prices has in numerous cases been fully offset by the rise in capacity. If a time series of wealth estimates were to be issued this problem would have to be engaged.

The Chamber of Commerce of the United States also receives many requests for information on the relative importance of small business, usually without precise definition as to what is small. More up-to-date wealth estimates of investment from time to time in small business assets would be useful.

In the study of debt and in the making of loans, information on wealth holdings is quite important. Here again mere historical costs or depreciated costs would be of less value than current replacement costs.

In the field of property taxation there are enormous variations from State to State and within States as to the methods of tax assessments. Part of the variation proceeds from variations in laws but much of the variation is due to the human factor. It would be hard, perhaps impossible, to find an area in which hunch, politics, and incompetence is as rampant as in this area. This could be greatly illuminated by a periodic wealth inventory based on objective methodology. A comprehensive estimate of wealth inventories across the country, but broken down by States, counties, etc., could be highly useful to students in the social sciences, legislators and tax administrators.

In the study of concentration in the antitrust sense, better information on wealth inventories might be useful. The problem of avoiding disclosure would have to be faced. Data on concentration have been subjected to great abuse, however, and it might be that more data would add to the volume of published material without adding to human insight or understanding!

For domestic reasons as well as international, it would be helpful to have better information on the age composition of productive assets. For example, what proportion of equipment is over 40 years old? Over 30 years old? Over 20 years old? A quinquennial census of this type would be most helpful for analysis and possibly for public policy purposes.

If the task of making a total wealth inventory estimate seems too formidable, possibly a beginning could be made by starting with key sections of the economy. Sample approaches should not be overlooked.

Based on previous experience with other statistical materials and series it is a fair assumption that such statistics as might be developed by an objective and scientific periodic wealth inventory would find innumerable uses, many of which are not now foreseen but would emerge as the data became more widely available, more refined, more reliable and available in greater breakdown by industry, by region, State and perhaps even county, etc. That is, even if the possible uses of wealth inventory data now foreseen may seem limited, this is an inadequate measure of their probably future value and usefulness.

## 2. STATEMENT BY GEORGE TERBORGH, RESEARCH DIRECTOR, MACHINERY & ALLIED PRODUCTS INSTITUTES

Let me say first of all that our field is primarily business capital goods, and that our interest lies particularly in this area. Let me suggest a few possibilities here:

1. We should very much like to have reliable figures, preferably for several periods or points in time, on the size of the gross stock of business plant and equipment, broken down at least into these two categories, and further, if possible, by major industrial divisions.

2. These capital stock series should be available after depreciation as well as gross.

3. We should appreciate anything that can be developed on the original-service-life composition of the gross stocks or, lacking this, at least average service lives by categories.

4. Similarly, we should appreciate also data on the attained-age composition, again with averages as a minimum.

## 3. STATEMENT BY FRANK L. FERNBACH, AMERICAN FEDERATION OF LABOR AND CONGRESS OF INDUSTRIAL ORGANIZATIONS

I have discussed your letter and its enclosure with several of my colleagues, and we find ourselves very much interested in what this kind of study might turn up. We can anticipate several areas in which more effective data would be helpful to use in our work.

In the first place, we hope that better information about real capital stock would tell us more about the productivity of capital and the degree to which it is increasing over time. This type of information is highly significant for those who are concerned with the interrelationships of wages, profits, prices, depreciation set-asides and requirements for capital formation generally.

Furthermore, a study of wealth which includes real capital stock estimates would give us more precise information about the amount of capital required per worker in various industries and significant changes over time. Perhaps it would also give us more precise information about the age of our capital stock. Moreover, the study might also provide useful information about the amount of automated equipment in relation to total capital stock. We realize the difficulty of distinguishing between automated and nonautomated equipment in general. However, this difficulty could be overcome, perhaps, by focusing on easily distinguishable types of automated equipment such as computers, numerically controlled machines and transfer lines. We note that some companies are beginning to treat their computer programs as capital expenditures. Such programs, embodied in tapes, should certainly be regarded as a form of tangible wealth, and the possibility of counting them as such should also be explored.

In addition, if the proposed study would increase our knowledge about the productive tangible asset holdings of government at various levels, this too would be of great value to those concerned with budgetary and fiscal problems.

Finally, further information which might be obtained from the study about the wealth holdings of individuals would add significantly to our knowledge in an important area in which Lampman and

others are now pioneering. We are tremendously interested in knowing much more about the magnitude of personal wealth holding, its distribution and changes over time.

All of the areas indicated above involve matters of specific interest to the AFL-CIO. In addition, there doubtless would be many other uses of importance to us to which the findings of the proposed Wealth Inventory Study might be put by us.

#### 4. STATEMENT BY JOHN P. LEWIS, COUNCIL OF ECONOMIC ADVISERS

The development of a comprehensive, reasonably detailed, set of national wealth or national balance sheet estimates is long overdue in the evolution of American social accounting.

Just as a matter of completeness or symmetry, it is strange in a country with as sophisticated and elaborate economic statistics as the United States not to have a set of stock data that are comparable to our highly developed national income accounting system.

But the main case for comprehensive, adequately detailed asset data, of course, lies in the concrete uses that can be made of them. Such uses are many and at least as plentiful for private analysts as public. But from the viewpoint of policy-oriented Government economic analysis I would cite by way of illustration uses of comprehensive national wealth data in the following important areas of economic policy and analysis:

##### 1. *Promoting economic growth*

The study of gross and net capital-output relationships by industries and sectors for such purposes as—

Judging the investment share of gross national product that would be consistent with sustained full employment growth.

Analyzing longer run trends in capital productivity and labor productivity.

Improving our estimates of potential gross national product at full utilization of our productive capacity.

##### 2. *Business conditions forecasting*

The forecasting of expenditures in all of those GNP sectors—including consumer durables, housing, and business fixed investment as well as inventory investment—where there are important stock-flow relationships.

Broadening and improving our measures of capacity utilization by industries and sectors not only to aid in analyzing the current level and trend of economic activity, but in measuring the cyclical impact of variations in utilization on labor productivity and hence labor requirements.

##### 3. *Price-wage policies*

Balance sheet data on fixed assets and total assets by industries together with flow data can be used to—

Estimate the capital requirements and the capital financing requirements of different industries.

Evaluate implications of industry trends in returns to capital for wage-price norms (such as the Johnson administration's wage-price guideposts).

Measures of capacity utilization in different industries are also needed to—

Anticipate potential bottleneck areas where price pressure might develop.

Develop more meaningful estimates of industry cost-profit trends by stripping away the effects of fluctuations in capacity utilization on unit labor costs and rates of return.

#### 4. *Public sector needs*

Detailed knowledge of Federal, State, and local capital stocks used in the multitude of public services these governments perform is necessary in order to—

Measure the efficiency with which services are being provided.

Develop projections of future capital requirements in the public sector.

#### 5. *Problems of equity*

Improved estimates of the asset holdings of individual and family units are a much needed adjunct to income-size classification in evaluating the impact of overall fiscal and monetary policies, and in designing policies to eradicate poverty.

In order to further these and a good many other kinds of analysis I hope that the statistical development this study suggests will be vigorously pursued.

#### 5. STATEMENT BY JACK ALTERMAN, CHIEF, OFFICE OF ECONOMIC GROWTH, BUREAU OF LABOR STATISTICS

The needs of the Interagency Growth Project for wealth estimates may be summarized as follows:

1. Stock of fixed plant and equipment, by industry, are to be used in deriving capital-output ratios.

2. The stock estimates need to be developed on both a gross and net basis, and also on a historical, constant, and current valuation basis. The constant dollar figures can be used in deriving alternative capital output ratios while the current dollar stock estimates would be used in the projections and analyses of distributive shares and returns to property. The net and gross figures are needed to assure consistency with the depreciation estimates.

3. The net capital stock and related depreciation figures should be shown with separate adjustments to exclude the effect of changes in depreciation methods.

4. The capital stock estimates should be further distributed between plant and equipment. The equipment estimates should then be distributed by type of equipment, i.e., by producing industry in order to develop a capital stock matrix (by producing and consuming industry).

5. The detailed plant and equipment estimates should also be distributed by age in order to provide the basis for developing depreciation estimates, and estimates of discards as part of a perpetual inventory approach. This would also be used in evaluating the status of technology in terms of the approach used by Dr. Ann Carter (Harvard Economic Research Project), which associates age distribution of capital stock with differential inputs of labor and materials and differential capital-output ratios.

6. Inventory data should be distributed by holding and producing industry for inventory of materials, and by holding industry for goods in process and finished inventories.

6. STATEMENT BY HERBERT STEIN, RESEARCH DIRECTOR, COMMITTEE FOR ECONOMIC DEVELOPMENT

The research staff of the Committee for Economic Development (CED) has followed with great interest your exploratory work of the wealth study toward the development of wealth estimates for the U.S. economy.

Since its formation over 20 years ago, the CED has been devoting its energies to economic research, with a view to developing understanding of major national economic policy issues, so that informed timely programs of action can be initiated and carried through to the benefit of the people and the Nation. It is in this context that we consider the basic research effort in the field of wealth statistics as promising a new dimension for better understanding the working of our economic system. In combination with the national income statistics, the estimates of wealth will hopefully provide an integrated set of balance sheet and income accounts, which should make possible a new major breakthrough in establishing vital relationships governing the efficient development of our economy.

While we are, of course, vitally interested in information which helps us understand and explain past and present events, the orientation of the work of CED is toward statements on national policy aimed at improving future performance. When I say this, what I have in mind is to stress the need for up-to-date statistics on the performance of the national economy. Hence, we are primarily interested in the global data rather than in the very detailed statistics, and we would urge attention to techniques which will provide such information on a relatively current basis. We recognize that this is still a dream and that before it becomes a reality much spadework, such as is being done by the Wealth Inventory Planning Study Group, must be carried through.

From what I have said, I think it is clear what our major interest is and what our major use of wealth estimates are and will be. I might just call to mind two of our recent statements, "Fiscal and Monetary Policy for High Employment" and "Reducing Taxes for Production and Growth." There is universal agreement among experts on fiscal, monetary, and tax policies that understanding of the relationship of such policies to the performance and growth of the economy would be vastly improved if we had at hand reasonably reliable information on stocks of wealth integrated with the well-established national income and expenditure information presently available to us.

7. STATEMENT BY JOEL DARMSTADTER, RESEARCH STAFF MEMBER, NATIONAL PLANNING ASSOCIATION

1. The immediate, practical, high-priority need, with respect to the National Planning Association long-range economic projections, is the development of a systematic series of private capital stocks—nonresidential structures and producer durables.



2. Such data are indispensable to the making of economic projections.

(a) They are necessary to the development of capital-output ratios which are crucial to the analysis and statistical measurement of economic growth.

(b) They are necessary to estimating prospective level of investment expenditures (both for expansion of capital stock and for withdrawal of obsolescent facilities), and thus have important implications for resource allocational questions, the adequacy of savings, and the role of financial intermediaries.

(c) They provide important clues as to the economy's rate of capacity utilization—hence, its actual operation relative to its potential, which in turn has a strong bearing on economic policy formulation.

(d) They are necessary to make estimates of nationwide depreciation of capital, hence to make estimates of net national product.

3. NPA's National Economic Projections Series has, since its inception in 1959, relied upon whatever estimates of capital stocks were available in order to furnish answers to the points raised above. But there is no question that these estimates are far from satisfactory. If in no other way, this is revealed by the fact that we have been compelled to shift from one capital stock series to another at least three or four times in each of the last 5 years. We have, at various times, used capital stock estimates prepared by the Machinery and Allied Products Institute (which, itself, illustrated its own uncertainty by a fundamental shift in its price-deflation practices a few years ago), the Council of Economic Advisers (Robert Solow), and most recently, the Office of Business Economics. A dramatic example of our uncertainty in this area can be gained by comparing the projected rate of expansion in capital stocks in the 1962 edition of NEPS with that in the 1963 edition. In the earlier case, the 10-year projection was 3.6 percent; in the more recent projection, 3.2 percent. This change was not one of judgment, but rather one arising from the more recent OBE series. Our notation on this change—no doubt unconvincing—ran as follows: the "analysis suggests that, in both historical and projected periods, we may have overstated capital expenditures to expand stocks, and understated capital expenditures serving to replace and modernize stocks. The somewhat additional weight, assigned in this year's report to the latter two factors, is reflected in the fact that, accompanying a somewhat slower rate of increase in capital stocks, the projected level of capital expenditures is essentially unchanged."

4. The unsettled state of capital stock measurement is further illustrated by the fact that in the Jaszi (et al.) article in the Survey of Current Business (November 1962), no less than five alternative estimates of gross stocks are given, depending on alternative assumptions about deflation and service lives; and there are eight alternative estimates of net (depreciated) stocks—the additional alternatives being the consequence of alternative depreciation procedures.

5. From these observations, and other considerations, we can sum up what we regard as needed improvements in capital stock measurement, as an aid to long-range economic projections:

(a) Better approximations of "economic" life than estimates of retirement based largely upon accounting for tax purposes. If possible, this should be a continuing rather than a "one point in time"

analysis. The fixed-life assumption, coupled with the cumulated expenditure procedure of the "perpetual inventory" method, has undoubtedly greatly distorted the long-term measurement of capital stocks.

(b) Some improvement, if possible, in price indexes—particularly in the construction-cost indexes used to measure growth of business plant. The adequacy of the producer-goods deflator, from the standpoint of understanding quality improvement (even when real cost increases are involved) has also been questioned, and might require a wholesale program to refine price index numbers. Of course, improvements are always possible everywhere. But in the case of capital stock measurement, the matter of deflation has critical importance.

(c) Of perhaps a lesser order of priority—but exceedingly important—further disaggregation of capital stock estimates by industry. This would be tremendously useful to our projections of industry outputs, employment, and productivity.

(d) Consideration to supplementing, or at least corroborating, the perpetual inventory method of capital measurement by census-type wealth inventories, which would also provide insight into businessmen's views of capacity conditions and preferences.

6. From the standpoint of NPA's PARM project, two comments may be added:

(a) The collection of wealth statistics on a company basis should be avoided insofar as possible. This basis effectively precludes disaggregation by region and area or resource point as required for emergency damage assessment purposes. The data should be collected on an establishment basis by permanent plant number.

(b) Assuming that wealth data are to be collected by a variety of statistical agencies, exploration is needed of the feasibility and methods of obtaining periodic statements of national wealth by means of a permanent roster, or data bank, in which all agencies would participate.

7. The significance of national wealth inventory statistics for the National Resource Evaluation Center (NREC), Office of Emergency Planning has been developed in a memorandum for Messrs. Green and Coker of OEP, excerpts from which follow. [See Statement 8.]

#### 8. STATEMENT OF JOHN DEWITT NORTON, DEPUTY DIRECTOR, ECONOMIC PROGRAM CENTER, NATIONAL PLANNING ASSOCIATION

The wealth inventory can be expected to contribute much useful data for damage assessment purposes. The commuter routines in use at NREC might also contribute a good deal to the data processing work on the inventory. For these reasons an exploration of mutual interests at first hand is suggested.

(a) *Wealth statistics.*—A census of wealth was one of our oldest economics statistics programs. The last census was conducted in 1923. However, the results were so unsatisfactory that no effort has since been made to repeat it. In the meantime, a national balance sheet has come to be recognized as an essential part of the national accounts. The pioneer estimates of Raymond Goldsmith in "The National Wealth of the United States" have contributed further to an appre-

ciation of the usefulness of balance sheet data in general economic analysis. Consequently, a movement has slowly been gathering support for reinstatement of the census of wealth as a regular, recurring statistical program of the Federal Government. The approach taken by Professor Kendrick's group, however, is that it may be more practical as well as politically more expedient to obtain the same data by developing a systematic set of supplementary questions to be added to existing economic surveys.

(b) *Value of real assets as input to damage assessment.*—It is proposed that the National Wealth Inventory collect data on the value of fixed assets and of inventories of finished goods, goods in process, and materials and supplies. For the most part such value information is now lacking in the NREC resource point file. The incorporation of values as a separate data field would obviously make the file a more effective planning instrument. Original costs or current reproduction cost valuations of resources would facilitate monetary estimates of the extent of damage, aggregation of damage over broader classes of resources, as well as assisting in the estimation of the costs of repair, restoration, or replacement.

(c) *Company or establishment data.*—The contribution of the wealth inventory to NREC will depend on whether the data are collected on an establishment or a company basis. Only establishment data can be identified with a specific resource point. If the company basis is adopted, only information from single establishment companies could be incorporated in the file. The advocates of company statistics can make a strong case for reporting convenience and this seems highly persuasive when the burden on the respondents is considered alone. But the advocates of better regional and area statistics can point out that the collection of data on a company basis effectively precludes the kind of differentiation they are seeking. This phase of the current discussion of the development of the Federal statistical system, incidentally, is one in which NREC has a large stake and in which its needs should be clearly heard.

(d) *Permanent roster statistics.*—One way of reducing the burden on the respondent is never to ask for the same information twice. The major part of an inventory of wealth is concerned with fixed assets. The desired information consists of original costs and additions, retirements, and also depreciation and depletion, as they occur. This information can be maintained in a permanent roster consisting of original entries and changes. The maintenance of such a roster on such a large scale was not really practical when data processing was exclusively a matter of punched cards. Contemporary electronic equipment, however, opens up new possibilities for reporting and accounting for the national wealth. An interesting recent development is the permanent plant file of the Bureau of the Census, but this so far is used primarily for time series data on current operations.

(e) *Coordination of wealth survey data.*—The decision to use, in the main, existing statistical programs to collect wealth data imposes a major problem of coordination. The surveys in which the data originates will be conducted at different dates, for different purposes, and often with different classifications of respondents and items of information. A substantial amount of analysis and of special data

processing would be required to create a consistent statement of the national wealth as of a given date.

(f) *The PARM resource data routines.*—The problem of coordination involved in the wealth inventory is very similar to the one faced in the implementation of the PARM system. Information incorporated in the NREC resource point file is collected by many agencies, at different dates, originally for different purposes, using various classification schemes, and is maintained in many separate categories. In order to provide resource data inputs to the PARM system on a consistent and uniformly updated basis, procedures have been developed for resource file changes, consolidation into a single file, and an edit of national summaries. Resource adjustment factors may be applied to effect changes in a given data field (corrections for price level, underenumeration, etc.) or to impute one data field from another. Although some supplementary routines would be needed, essentially all of the software needed for processing wealth data from diverse sources into consistent national summaries already exists at NREC.

(g) *NREC as a statistical center.*—The computing facilities, including the software, necessary for the consolidation of a national wealth inventory are largely available at NREC. The existing resource point file provides the basis for the establishment of a permanent roster of wealth data. Furthermore, the delegate agency participation in the work of NREC furnishes the basis for the administrative coordination of the wealth surveys and their incorporation into a single data bank. Note, too, that “national wealth inventory” and “national resource evaluation” are virtually synonymous.

(h) *Recommendations—wealth study project.*—The advisability of creating a study panel on the problems of administrative, statistical, and computational coordination of wealth data to be collected by various agencies has been suggested to Professor Kendrick.

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APPENDIX I: PART B  
HISTORICAL CENSUSES AND ESTIMATES OF WEALTH  
IN THE UNITED STATES

By STEPHEN A. HOENACK  
The George Washington University

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## FOREWORD

Mr. Stephen A. Hoenack has prepared a master's thesis under my direction at The George Washington University summarizing and evaluating the historical censuses of wealth in the United States. His summary and evaluation of the censuses will be helpful in planning more useful collections of wealth data in the future.

The early U.S. wealth censuses covered the 9 years 1850, 1860, 1870, 1880, 1890, 1900, 1904, 1912, and 1922. As Mr. Hoenack points out in his introductory chapter, each of the first six was specifically authorized by law; the remaining three were authorized generally by the 1902 permanent census law. The work of the Census Bureau consisted chiefly in adapting the data it collected on property assessments by State and local governments, and supplementing these by data collected by other agencies, or by its own estimates where gaps remained.

The preparation of wealth estimates was dropped by the Census Bureau after 1922 because of serious questions as to their utility for reasons discussed in some detail by Mr. Hoenack.

Despite the shortcomings of the early censuses of wealth, and in part because of them, this experience should be examined carefully as part of the job of preparing for more meaningful and useful wealth data collections and estimates in the future. The members of the Wealth Inventory Planning Study are grateful to Mr. Hoenack for undertaking this summary and review, and we are pleased to make available the bulk of his thesis. His introductory chapter is not reproduced since the conceptual problems he treats there will be handled at greater length in other background papers for the Wealth Study.

JOHN W. KENDRICK,  
*Staff Director, Wealth Inventory Planning Study.*

# HISTORICAL CENSUSES AND ESTIMATES OF WEALTH IN THE UNITED STATES

## I. SURVEY OF THE CENSUSES OF WEALTH

The extent and types of analysis made possible by a given wealth study depend on its particular framework and types of valuation. In this light, the categories given for wealth, their coverage, and the geographical breakdowns of their valuations will be discussed for each census of wealth. Then the types of valuations and their meanings will be outlined. In order to permit easy determination of the comparability of the frameworks and valuation types of the censuses of wealth, liberal use will be made of tables.

### CATEGORIES GIVEN FOR THE ASSETS, AND THEIR COVERAGE

The categories of assets given in the censuses of wealth appear in the tables. The first three censuses give no breakdown at all, lumping all taxable real and personal property (with some exempt personal property in 1870). In all censuses of wealth starting with 1880 there are separate categories for taxable real property, exempt real property, and several types of personal property, the breakdowns becoming finer with time.

The assets of most of the large public utility type businesses were given separate treatment, 1880 and after, by the type of business owning them, but there was no functional breakdown of their assets by type. All manufacturing establishments are lumped; their machinery, tools, and equipment were included as a separate category, and their lands and buildings included with taxed real property. Similarly, the tools and machinery of farms were treated as a category, their lands and buildings being included as taxed real property. Farm and nonfarm livestock were included as a category. Remaining categories included stocks of agricultural, mining, manufactured and imported products, household equipment, and the coinage and bullion of the country, and others.

Table 1 explains the coverage of the categories of the earlier censuses of wealth as much as possible in terms of the coverage of the later censuses. The categories used in the 1900, 1904, 1912, and 1922 censuses are given reference numbers which are then used in the discussion of the coverage of the early censuses.

TABLE 1.—*Probable intended coverage of the categories of the censuses of wealth*

Category	1850 and 1860 coverage	1870 coverage
Real and personal property.....	Dependent primarily on the county and State tax laws as enforced, which included certain financial instruments.	Same as in 1850 and 1860 except an undetermined amount was added by the marshals for exempt personal property, mostly household goods.
Category	1880 coverage (using later numbering)	
Real property and improvements, taxed:		
Farms.....	} Category 1 (except for mines).	
Residence and business real estate including waterpower.....	} Category 2.	
Real property and improvements, exempt.....	} Categories 3 and 4.	
Livestock, on and off farms and farming tools and machinery.....	} Category 20 and parts of category 1.	
Mines (including petroleum wells) and quarries with one-half of annual product.....	} Category 22.	
Specie.....	} Category 6.	
Railroads and equipment.....	} Categories 9 and 13.	
Telegraphs, shipping, and canals.....	} Categories 17, 18, and 19.	
Three-fourths of the annual product of agriculture and manufactures and imports.....	} Category 21.	
Household furniture, paintings, books, clothing, jewelry, and household supplies of food, fuel, etc.....	} Category 21.	
Miscellaneous items, including tools of mechanics.....	} Not known, probably categories 5 and others.	
Category	1890 coverage	
Real property and improvements, taxed.....	} Category 1 (except for mines).	
Real property and improvements, exempt.....	} Category 2.	
Livestock on farms, and farm implements and machinery.....	} Categories 3 and 4.	
Machinery of mills and product on hand, raw and manufactured.....	} Categories 5 and 18.	
Mines and quarries, including product on hand.....	} Category 20, parts of category 1.	
Gold and silver coin and bullion.....	} Category 22.	
Railroads and equipment.....	} Category 6.	
Street railways.....	} Category 8.	
Telegraphs, telephones, shipping, canals and equipment.....	} Categories 9, 10, and 13.	
Miscellaneous.....	} Category 21.	



TABLE 1.—Probable intended coverage of the categories of the censuses of wealth—Continued

Reference No.	Category	Coverage, 1900 and 1904	Coverage, 1912	Coverage, 1922
1	Real property and improvements taxed.	Census Bureau definition <sup>1</sup> excluding railroads, street railways, telephone and telegraph systems, privately owned waterworks, privately owned electric stations.	Same.....	Same.
2	Real property and improvements exempt.	Exempt property of all government, church, educational, charitable, and fraternal organizations plus small amounts of real property of clergymen, soldiers, and others.	do.....	Same except for exclusion of street pavements and sewer systems.
3	Livestock.....	All livestock on and off farms including poultry and bees.	do.....	Same.
4	Farm implements and machinery.	All such property enumerated by the census of manufactures.	do.....	Same except for motor vehicles.
5	Manufacturing machinery, tools, and implements.	Those enumerated by the census of manufactures.	do.....	Same.
6	Railroads and their equipment.	All railroads with their terminal and switching property except for land where assessed as real property and included separately.	do.....	Do.
7	Motor vehicles.....	Not estimated.....	Not a separate category.	Relevant part of categories 4, 21.
8	Street railways.....	Companies reporting to the Census Bureau (nearly all companies in United States).	Same.....	Same.
9	Telegraph systems.....	do.....	Wireless telegraph systems added.	Same as 1912.
10	Telephone systems.....	do.....	do.....	Do.
11	Pullman and other cars not owned by railroads.	Pullman, express company, and other privately owned cars.	do.....	Do.
12	Pipe lines.....	Not estimated.....	Not estimated.....	All in country.
13	Shipping and canals.....	Merchant marine, naval vessels, canals and canalized rivers.	Same.....	Same.
14	Irrigation enterprises.....	Not estimated.....	Not estimated.....	Only those in Western States.
15	Privately owned waterworks.	Rough estimate intended to cover all such property in the United States.	Same.....	Same.
16	Privately owned central electric light and power stations.	Companies reporting to the Census Bureau (nearly all companies in the United States).	Same.....	Same.
17	Agricultural products.	All animal and vegetable products held by farmers and traders (computed as proportion of production).	Same.....	Same.
18	Manufactured products.	All manufactured products held by manufacturers and traders (computed as proportion of production).	Same.....	Same.
19	Imported merchandise.	All imports held by producers and traders (computed as proportion of production).	Same.....	Same.
20	Mining products.....	All coal and other minerals held by mines and traders.	Same.....	Same.
21	Clothing, personal adornments, furniture, horsedrawn vehicles and kindred property.	Rough estimate intended to cover all such property as stated in the United States.	Same.....	Same except for category 7.
22	Gold and silver coin and bullion.	All gold and silver coin and bullion in continental United States.	Same.....	Same.

<sup>1</sup> This definition comprises all land and fixed improvements on it.

The first three censuses of wealth, for the years 1850, 1860, and 1870, relied on county assessments for purposes of taxation of all property, real and personal, and estimated percentages of the true value that the assessments represented. After 1870, the valuation of personal property was determined through use of other methods; however, the valuation of real property was still obtained through use of the assessments and estimated percentages. In all cases, the use of assessments gave rise to two problems: first, it was not always known what assets the assessments covered, especially after the assessment for several counties or States were aggregated; second, breakdown into desired categories for the country was possible only where all counties made the same breakdowns in assessing the property, and reported them separately (which rarely happened).

The difficulty of knowing the coverage of the assessments resulted from the fact that the assessing counties did not always follow uniform rulings as to what property was taxable and what was not.<sup>1</sup> Where these rulings were uniform, enforcements were often not. In all cases where it was possible to determine the coverage of the assessments and in what respects it differed from the Census Bureau definitions, attempts were made to allow for the differences. Where the breakdown reported by the counties was sufficient, making this allowance was simple. However, often the breakdown was not sufficient, especially in regard to personal property, and it was necessary for the Census Bureau to estimate overlaps. The Census Bureau did comparatively little of this estimation, having little detailed knowledge of the assessments; it had not made the estimates of the proportion of true value that the assessments represented (this was done by the U.S. marshals in the 1850-70 censuses).

The problem of lack of knowledge of the coverage of valuation estimates obtained through use of the assessments is particularly acute in regard to personal property values for 1850, 1860, and 1870. In order to determine precisely what was included in the estimates, it would be necessary not only to study the existent tax laws but to search county records to determine which tax laws were enforced. It is known that most counties taxed mortgages and other credit instruments as personal property, and thus they were included as wealth, completely inappropriately. The census reports rationalized this by noting that the wealth of some States consisted largely of real property which was heavily mortgaged to persons living in other States. It seems apparent that many of the items included in the later censuses of wealth, such as household goods, personal effects, and related items, have been typically exempted from taxation or overlooked by the assessors, of course, depending on the State and locality. However, machinery and equipment of manufacturing establishments were usually included, at least in the tax laws. In any event, it is im-

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<sup>1</sup> In pt. III of the "Report on Wealth, Debt, and Taxation" for 1900 and 1904 is a very comprehensive digest of State and local tax laws by Prof. Carl C. Plehn of the University of California. From the summary it can be seen that the coverage of the tax laws for real property is relatively uniform; with the exception of differences in exemptions of real property, the primary variations among State laws were the treatments of rights to possession of lands (these were significant in only a few Western States). Some of the variations in the treatment of exempt property were fairly great, but of such a nature that evening up of the coverage of valuations would not be too difficult. As for personal property, there are possibly enormous differences in coverage by the laws, involving whole categories of property. Entire separate valuation for these categories and parts of others would be necessary for evening up coverages of the valuations for States.

possible to know exactly what the coverage of the valuations of personal property included.

A further complexity affecting the comparability of the first three censuses of wealth was the change in coverage of tax laws, probably in net effect to include less personal property for taxation in later years. The indications of this were the attempts by localities to encourage capital expansion and the growing feeling that taxations of mortgages was in effect double taxation of real estate. This change was probably significant, but it is difficult to determine just how significant.

Finally, the assessments allowed no categorization of the estimates of value of personal property, and so the value has to be used in its entirety. Also, there is no knowledge of changes in the relative values of different types of personal property.

Over the 1850-70 period the tax laws and their enforcement covering real property tended to be more uniform than the laws and their enforcement covering the taxability of personal property. Thus the valuation of real property and improvements tended to be more meaningful than those for personal property. Unfortunately the real property valuations were not included separately from the personal property valuations; thus use of the former requires dealing with the problems associated with both.

The 1880 Census of Wealth inaugurated two new approaches. First, personal property was valued independently of its taxation, generally through use of enumerated information, and second, the percentages of real value that the assessments represented were estimated by the Census Bureau itself instead of by the local marshals. It was necessary for the Census Bureau to carry out considerable research in order to estimate the percentages of true value that the assessments represented; this research also yielded information which was helpful in determining what the assessments included. The result is that after 1880 the coverage of the estimated valuation of real property much more nearly conforms to the definitions except where explicitly indicated to be otherwise.

The Census Bureau definition of taxed real property and improvements in all the censuses of wealth included all taxed land and the fixed improvements on it with specified exceptions after 1880. The exceptions were included with the valuations for personal property. Whatever exceptions there were before that time were not specified, but since valuations of real and personal property were not totaled separately, it did not matter whether an asset was included as personal or real property unless it was included as both in the same locality.<sup>2</sup>

Valuation of property exempt from taxation occurred first in the 1870 estimate, which included an undetermined amount for exempt personal property, probably consisting largely of household and other items of a personal nature, and no public holdings. This valuation was taken into account by the marshals in their estimation of the percentages. After 1870 both taxed and exempt personal property were valued without distinction. Thus after 1870 the only exempt property treated as such was real property.

<sup>2</sup> In the 1870 Census of Wealth the total valuation for real and personal property contained an addition for exempt real property. Thus it did matter whether or not exempt property was included as real property or as personal property, since exempt real property was not included. However, the quality of the estimates is such that they are not amenable to refined analysis.

The 1880 Census of Wealth included a separate value for exempt real property, but it was given only nationally. It was distributed in an undetermined way to the States, since it was impossible to separate the State values for taxable real property and exempt real property. This value was probably intended to include the same assets as the later assets included: all exempt real property of all levels of government and of religious, educational, charitable, and fraternal organizations and of clergymen and soldiers. However, it is probable that the estimate is extremely rough. The values for exempt real property for all the later censuses were distributed separately to the States. They are probably all better than the 1880 estimate, though they vary in quality; it is suspected that the 1900, 1904, and 1922 valuation estimates were much more thorough than the 1890 and 1912 estimates.

The notes accompanying all the censuses of wealth including estimated valuations of exempt property commented that many critics believed that values of public assets should not be included because their values were implicit in the values of benefiting private assets. The census reports, instead of arguing that such complementarity could occur among assets regardless of whether they are publicly or privately owned, argued that certain public assets such as sewage disposal plants could detract from property values, and stated that the argument of the critics was to this extent weakened. Thus, for the wrong reason, public assets were included. The only exception explicitly mentioned was one pointed out in the 1922 Census of Wealth:

The values of such public improvements as street pavements and sewer systems are omitted from the tables for the reason that such properties, as a rule, have value in use only and not in exchange, and because of the fact that in most cities a part or all of the cost of such improvements is assessed against property presumably benefited by the improvement, such presumption doubtless being taken into account by officials in determining assessed valuations for purposes of taxation.<sup>3</sup>

It is difficult to determine to what extent exclusions of this sort were made in the earlier censuses of wealth; there is no statement in any of them regarding this matter. In the tables it will be assumed that no other exclusions have been made.

The values of personal property in the 1880 census and after primarily were enumerated or were estimated on the basis of enumerated information. The coverage of the valuations for the large public utility type businesses is fairly clear; they were meant to cover the assets belonging to reporting companies in the businesses for which the categories were given. This included all such companies except in some cases where only companies over a certain small size were included. There is no information concerning the relative proportions of types of assets owned by the companies, as, for example, the relative proportions of land, buildings, and equipment represented in the valuations, for a given type of business.

The coverage of the valuations for manufacturing machinery and equipment included those assets belonging to practically all manufacturing businesses over a certain minimal size in the United States.

<sup>3</sup> "Wealth, Debt, and Taxation," 1922, p. 6.

Likewise the coverage of the valuations for farming machinery and equipment is all such assets belonging to enumerated farms. These values can be compared with the values for land and buildings of those businesses and farms through reference to the censuses of manufactures and agriculture. (In the censuses of wealth, the values for the lands and buildings of business and farming establishments are included in the values for real property.) There are no breakdowns of types of machinery and equipment for farming or manufacturing establishments, or of the machinery and equipment of different types of establishments although this latter information could be obtained from the censuses of agriculture and the censuses of manufactures in years when values of machinery and equipment were enumerated separately from lands and buildings of manufacturing establishments.

The coverage of the valuations for livestock consists of all livestock, off and on farms, which were enumerated.

The valuations for agricultural, mining, imported, and manufacturing stock were obtained through use of production and import figures which came from enumerated producers and importers. The coverage of these stock figures is interpreted as stocks produced by and imported by those companies; stocks of goods which were not produced or imported by those companies are not interpreted as having been included in wealth estimates. Thus, for example, stocks of smuggled imports and illegal domestically produced goods are not included.

Values for household goods were independently estimated by the Census Bureau because of lack of existing data. The estimates were so rough that it is difficult to ascertain even their intended coverage. It appears that the Census Bureau officials intended to give principal focus of coverage to reproducible items in fairly general use, such as utensils, tools, furniture, and clothing. Specialized, rare and principally decorative items, especially those having substantial value, were probably given much less than proportionate weight, although this weight undoubtedly varies from census to census.

The coverage of the estimated values of coin and bullion includes all coin and bullion in continental United States.

#### GEOGRAPHICAL BREAKDOWN OF THE VALUATIONS FOR EACH CATEGORY

Table 2 outlines the geographical breakdown of the censuses of wealth, giving for the categories of each census the smallest geographical unit for which valuations exist for all such units in the reports. For example, when for a category "State" is indicated, it would be possible to add all the State figures and obtain the national figures. There could be figures for some or many of the counties. But it would not be possible to obtain all the State figures from the county figures, for if it were, "county" would have been indicated instead.

Often smaller breakdowns were available on a partial basis; however, these were not usually included in the reports, and it would be difficult to obtain them from other sources. It is possible that there might be smaller breakdowns on a full basis for a few categories which were not included in the reports; again, it would be difficult to obtain them from other sources. It is likely that access to the records of the Census Bureau would produce such breakdowns or would facilitate the making of them.

TABLE 2.—Geographical units, by census, by type of asset

Year	Category	Smallest geographical unit for which there are valuations for all such units.
1850.....	Assessed real property.....	State.
	Assessed personal property.....	Do.
	Total assessed property.....	Do.
1860.....	Estimated true valuation of real and personal property.....	Do.
	Assessed real property.....	Do.
	Assessed personal property.....	Do.
1870.....	Total assessed property.....	Do.
	Estimated true valuation of real and personal property.....	Do.
	Values of real and personal property obtained by enumerators directly from owners.	County.
1880.....	Assessed real property.....	Do.
	Assessed personal property.....	Do.
	Total assessed property.....	Do.
1890.....	Estimated true valuation of real property, taxed.	National.
	Farms.....	Do.
	Residence and business real estate, including waterpower.....	Do.
	Real property, exempt.....	Do.
	All real property, taxed and exempt.....	State.
	Livestock, on and off farms, and farming tools, and machinery.	National.
	Mines, petroleum wells and quarries with ½ annual product.	Do.
	Specie.....	Do.
	Railroads and equipment.....	Do.
	Telegraphs, shipping, canals.....	Do.
	Three-quarters of product of agriculture, manufacturing, and imports.....	Do.
	Household furniture, paintings, clothing, jewelry, and supplies.	Do.
	Miscellaneous, including tools of mechanics.....	Do.
	All personal property.....	State.
	Assessed real property.....	County.
	Real property, taxed.....	State.
	Real property, exempt.....	Do.
	Livestock on farms, and farm implements and machinery.....	Do.
	Machinery of mills, and product on hand, raw and manufactured.	Do.
	Mines and quarries, including product on hand.....	Do.
	Gold and silver coin and bullion.....	Do.
	Railroads and equipment.....	Do.
	Street railways.....	Do.
Telegraphs, telephones, shipping, canals, and equipment.....	Do.	
Miscellaneous.....	Do.	
1900 and 1904.	Real property and improvements, taxed.....	County.
Real property and improvements, exempt.....	State.	
Livestock.....	Do.	
Farm implements and machinery.....	Do.	
Manufacturing machinery, tools, and implements.....	Do.	
Railroads and their equipment.....	Do.	
Street railways, shipping, waterworks, etc.....	Do.	
Street railways.....	National.	
Telegraph systems.....	Do.	
Telephone systems.....	Do.	
Pullman and other cars not owned by railroads.....	Do.	
Pipelines.....	Do.	
Shipping and canals.....	Do.	
Irrigation enterprises.....	Do.	
Privately owned waterworks.....	Do.	
Privately owned central electric light and power stations.....	Do.	
All other.....	State.	
Agricultural products.....	National.	
Manufactured products.....	Do.	
Imported merchandise.....	Do.	
Mining products.....	Do.	
Clothing, personal adornments, furniture, horsedrawn vehicles, and kindred property.....	Do.	
Gold and silver coin and bullion.....	Do.	

TABLE 2.—Geographical units, by census, by type of assets—Continued

Year	Category	Smallest geographical unit for which there are valuations for all such units.
1912.....	Real property and improvements, taxed.....	State.
	Real property and improvements, exempt.....	Do.
	Livestock.....	Do.
	Farm implements and machinery.....	Do.
	Manufacturing machinery, tools, and implements.....	Do.
	Railroads and their equipment.....	Do.
	Motor vehicles.....	Do.
	Street railways, shipping, waterworks, etc.....	Do.
	Street railways.....	National.
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Do.
	Pipelines.....	Do.
	Shipping and canals.....	Do.
	Irrigation enterprises.....	Do.
	Privately owned waterworks.....	Do.
	Privately owned central electric light and power stations.....	Do.
	All other.....	State.
	Agricultural products.....	National.
	Manufactured products.....	Do.
	Imported merchandise.....	Do.
	Mining products.....	Do.
	Clothing, personal adornments, furniture, horsedrawn vehicles, and kindred property.....	Do.
Gold and silver coin and bullion.....	Do.	
1922.....	Real property and improvements, taxed.....	State.
	Real property and improvements, exempt.....	Do.
	Livestock.....	Do.
	Farm implements and machinery.....	Do.
	Manufacturing machinery, tools, and implements.....	Do.
	Railroads and their equipment.....	Do.
	Motor vehicles.....	Do.
	Street railways, shipping, waterworks, etc.....	Do.
	Street railways.....	Do.
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Do.
	Pipelines.....	Do.
	Shipping and canals.....	Do.
	Irrigation enterprises.....	Do.
	Privately owned waterworks.....	Do.
	Privately owned central electric light and power stations.....	Do.
	All other.....	Do.
	Agricultural products.....	Do.
	Manufactured products.....	Do.
	Imported merchandise.....	Do.
	Mining products.....	Do.
	Clothing, personal adornments, furniture, horsedrawn vehicles, and kindred property.....	Do.
Gold and silver coin and bullion.....	Do.	

The total valuations for real and personal property for 1850 and 1860 were given by States, either the individual values for the counties obtained through use of percentages estimated by marshals, or State values directly obtained through use of weighted averages of reported percentages.<sup>4</sup> In 1870, the total valuations were given by counties. The percentages given by marshals were used directly for the valuation of the real and personal property of the counties.

In 1880, the valuations for all real property and for all personal property were presented by States. Breakdowns separating taxed and exempt real property and various classes of personal property were given nationally. In 1890, all valuations were given by States except for taxed real property which was given by counties.

<sup>4</sup> In 1860 values of real and personal property obtained directly from owners by census enumerators were tabulated by counties. This information had been obtained from owners by enumerations in 1850, but the forms were not processed.

In 1900, 1904, 1912, and 1922 two classes of personal property were further categorized. Totals for the classes, titled "street railroads, shipping, waterworks, etc." and "all other," were valued by States, but the separate values for their breakdowns were given only nationally, except for 1922, when they were given by States. All other values for categories of personal property and real property for those years were given by States.

Geographical breakdowns of values were obtained in one of two ways: they were directly derived by States or counties, or they were derived nationally and then distributed by States. Examples of values directly derived for States and counties are those based on assessments, and the enumerated values of farm and manufacturing businesses. Enumerated values of large public utility type businesses, usually dealing in several States, were given nationally. Other nationally derived valuations included those for gold and silver coin and bullion, the equipment belonging to average households, and stocks of manufactured, agricultural, and imported goods. These values were usually distributed to the States in accordance with related enumerated information such as their number of households, population, production values, and other data reported by the utilities, e.g., miles operated in the States by railroads. When such available enumerated information was not pertinent, values were distributed to the States in proportion to other forms of wealth reported for them.

#### VALUATION

Table 3 gives the types of valuations of categories of the censuses of wealth. It will be noted that the valuations for many categories were sums of different types of values. This resulted from the fact that a large proportion of the categories of the censuses of wealth contained wide diversity of assets, for which obtainable data gave mixed types of valuation. For many categories there is not even detailed knowledge of the extent and composition of this mixture of valuation types. The result is that many of the valuations given in the censuses of wealth are not very meaningful.



TABLE 3.—Valuation types

Year	Categories	
1850.....	Real and personal property, taxed.....	Primarily market value. <sup>1</sup>
1860.....	do.....	Do.
1870.....	do.....	Do.
1880.....	Personal property, not taxed.....	Do.
	Real property and improvements, taxed:	
	Farms.....	Do.
	Residence and business real estate including water-power.....	
	Real property and improvements, exempt.....	Mixture of market value and cost.
	Livestock, whether on or off farms, and farming tools and machinery.....	Market value.
	Mines (including petroleum wells) and quarries with 1/2 of annual production.....	Mixture of market value and cost.
	Specie.....	Face value of gold and other coins. Market value of bullion.
	Railroads and equipment.....	Primarily cost, some market value.
	Telegraphs, shipping and canals.....	Market value for shipping, cost and some market value for telegraphs and canals.
	Three-quarters of annual product of agriculture and manufactures and of importation of foreign goods.....	Market value.
	Household contents.....	Mostly cost.
	Miscellaneous items, including tools of mechanics.....	Mixture of market value and cost.
1890.....	Real property and improvements, taxed.....	Primarily market value.
	Real property and improvements, exempt.....	Mixture of market value and cost.
	Livestock on farms, and farm implements and machinery.....	Market value for livestock, cost minus depreciation, and some market value for other.
	Machinery of mills, and product on hand, raw and manufactured.....	Cost with some market value.
	Mines and quarries, including product on hand.....	Do.
	Gold and silver coin and bullion.....	Face value of gold and silver coins, market value of bullion.
	Railroads and equipment.....	Cost with some market value.
	Street railways.....	Do.
	Telegraphs, telephones, shipping, canals, and equipment.....	Annual earnings capitalized at 5 percent.
	Miscellaneous.....	Mixture of insured value, market value, assessed value, and indeterminable value.
1900 and 1904.	Real property and improvements, taxed.....	Primarily market value.
	Real property and improvements, exempt.....	Mixture of original cost and market value.
	Livestock.....	Market value.
	Farm implements and machinery.....	Cost minus depreciation and some market value.
	Manufacturing machinery, tools, and implements.....	Do.
	Railroads and their equipment.....	Capitalization of net earnings.
	Street railways, shipping, waterworks, etc., street railways.....	Do.
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Do.
	Pipelines.....	Not estimated.
	Shipping and canals.....	Cost only for Navy vessels, cost minus depreciation for other shipping, capitalized net annual earnings for canals.
	Irrigation enterprises.....	Not estimated.
	Privately owned waterworks.....	Mostly market value.
	Privately owned central electric light and power stations.....	Mixture of cost and market value.
	All other:	
	Agricultural products.....	Market value.
	Manufactured products.....	Do.
	Imported merchandise.....	Do.
	Mining products.....	Do.
	Clothing, personal adornments, furniture, etc.....	Cost.
	Gold and silver coin and bullion.....	Face value of gold and silver coins, market value of bullion.

See footnote at end of table.

TABLE 3.—*Valuation types*—Continued

Year	Categories	
1912.....	Real property and improvements, taxed.....	Primarily market value.
	Real property and improvements, exempt.....	One-eighth of real property taxed.
	Livestock.....	Market value.
	Farm implements and machinery.....	Cost minus depreciation and some market value.
	Manufacturing machinery, tools, and implements.....	Do.
	Railroads and their equipment.....	Do.
	Street railways, shipping, waterworks, etc., street railways.....	Cost of construction and some market value.
	Telegraph systems.....	Cost of some market value.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Do.
	Pipelines.....	Not estimated.
	Shipping and canals.....	Cost only for Navy vessels, cost minus depreciation for merchant marine, mixture for canals.
	Irrigation enterprises.....	Unknown.
	Privately owned waterworks.....	Mostly market value.
	Privately owned central electric light and power stations.....	Mixture of cost and market value.
	All other:	Market value.
	Agricultural products.....	Do.
	Manufactured products.....	Do.
	Imported merchandise.....	Do.
	Mining products.....	Do.
	Clothing, personal adornments, furniture, etc.....	Cost.
	Gold and silver coin and bullion.....	Face value of gold and silver coins, market value of bullion.
	1922.....	Real property and improvements, taxed.....
Real property and improvements, exempt.....		Mixture of cost and market value.
Livestock.....		Market value.
Farm implements and machinery.....		Cost minus depreciation and some market value.
Manufacturing machinery, tools, and implements.....		Do.
Railroads and their equipment.....		Do.
Street railways, shipping, waterworks, etc., street railways.....		Do.
Telegraph systems.....		Do.
Telephone systems.....		Do.
Pullman and other cars not owned by railroads.....		Do.
Pipelines.....		Unknown.
Shipping and canals.....		Cost minus depreciation and cost.
Irrigation enterprises.....		Unknown.
Privately owned waterworks.....		Mostly market value.
Privately owned central electric light and power stations.....		Mixture of cost and market value.
All other:		Market value.
Agricultural products.....		Do.
Manufactured products.....		Do.
Imported merchandise.....		Do.
Mining products.....		Do.
Clothing, personal adornments, furniture, etc.....		Cost.
Gold and silver coin and bullion.....		Face value of gold and silver coins, market value of bullion.

<sup>1</sup> All valuations based on assessments had been influenced by cost valuations to some extent. All costs are original except where indicated to be otherwise.

The valuations obtained through estimated percentages of market values represented by assessments for purposes of taxation correspond more or less to market value. However, the meaning of these valuations is not crystal clear: No knowledge exists of the extent to which the estimates are based on spotty sales figures or on estimated trends of movements of market values. Also there is no knowledge of the extent to which assessors used original cost information in assessing property, especially that with which they were not especially familiar, for example, buildings which were newly constructed or types of real property which were not usually found in their localities, such as mines. The problem of combinations of valuation types is especially acute in regard to the valuations given for exempt real property, which

were estimates made by the Census Bureau largely through use of information ascertained in connection with its estimation of the percentages of true value that assessments of taxed property represented. Exempt buildings are not often sold, and consequently market valuations would have been unrealistic for these. Thus original cost values were probably generally used. However, these values were not given separately from exempt land, which had to be given market values.

Enumerated values were often obtained by requesting businesses to give single estimates for combinations of types of goods. For the values of the lands, buildings, and equipment of public utilities the owners generally gave what was to them original cost, depreciated or undepreciated. The values given for land were sales value in the social accounting sense, generally at some undetermined date in the past. The values given for buildings and equipment were generally book cost, differing from current reproduction cost to the extent of price changes and the inadequacy of depreciation charges, if any were deducted from the reported values. There are no data concerning purchase dates of equipment by the companies; in order to update the values it would be necessary to make arbitrary assumptions on the age composition of the assets. The enumerated values for farm machinery and equipment and manufacturing machinery and equipment were also original cost reported by owners. However, to the extent that used machinery was reported, the valuations correspond to sales values at undetermined dates. Reported values for newly purchased equipment represent book costs: again, there is no information on purchase dates.

The types of valuations of some of the estimates made on the basis of related enumerated values were clear in meaning. Those values for stocks which were based on production figures correspond clearly to reproduction cost. Valuations for categories for other years updated to census years had the meaning (or lack of meaning) of the original valuations. Others, such as valuations of companies on the basis of capitalization of net earnings were not meaningful.

#### SUMMARIES OF INFORMATION GIVEN IN THE CENSUS REPORTS ON THE METHODS OF OBTAINING THE ESTIMATES

Table 4 gives for each valuation symbols corresponding to four basic methods of obtaining valuations. Table 5 gives the sources on which the valuations were based.

The amount of information given in the census of wealth reports was variable. The 1850, 1860, and 1870 censuses gave very little information of any kind. The 1880 report failed to give any explanation of its methods of obtaining valuation estimates of some of its categories, but explanation of the valuation of those categories was given in the other volumes of the decennial census. The 1890 report was more complete, except that it failed to explain how it valued exempt real property. The report for the 1900 and 1904 estimates (they were presented and explained together) gave the most complete information; not only were the methods of obtaining the estimates thoroughly explained but there was valuable discussion of what had been done in earlier censuses of wealth (some of this sort of discussion had been done in the 1880 and 1890 reports), and explanation was given of elaborate tests of those estimates and of earlier ones. The 1912

report gave general coverage of its methods but lacked desirable detail in many respects. The 1922 report was much better, giving perhaps as much detail in its explanation of methods as the report for 1900 and 1904.

TABLE 4.—*Methods of valuation for the censuses of wealth (1900 and after)*

Categories	1900	1904	1912	1922
Real property and improvements, taxed.....	A and E	A	A	A
Real property and improvements, exempt.....	Est (c) and Est (o)	Est (c) and Est (o)	Est (c)	Est (c) and Est (o)
Livestock.....	E/Est.	Est (c) and E/Est.	Est (o) and E/Est.	Est (o) and E/Est.
Farm implements and machinery.....	E	E/Est.	E/Est.	E/Est.
Manufacturing machinery, tools, and implements.....	E	E/Est.	E/Est.	E/Est.
Railroads and their equipment.....	E/Est.	E/Est.	Est (o) and Est (c)	E/Est and Est (c)
Motor vehicles.....			E/Est.	E/Est.
Street railways.....	E/Est.	E/Est.	E	E.
Telegraph systems.....	E/Est.	E/Est.	E	E.
Telephone systems.....	E/Est.	E/Est.	E	E.
Pullman and other cars not owned by railroads.....	E	E	E	E.
Pipelines.....				Est (o).
Shipping and canals.....	E/Est.	E/Est.	E and E/Est.	Est (o).
Privately owned waterworks.....	Est (o)	Est (o)	Est (o) and Est (c)	A.
Privately owned central electric light and power stations.....	E/Est.	E/Est.	E	E.
Agricultural stocks.....	E/Est.	E/Est and Est (o)	E/Est and Est (o)	E/Est.
Manufacturing stocks.....	E/Est.	E/Est.	E/Est and Est (c)	E/Est.
Imported stocks.....	E/Est.	E/Est.	E/Est.	E/Est.
Mining products.....	E/Est.	E/Est.	E/Est and Est (o)	Est (o) and Est (c)
Clothing and personal adornments, etc.....	E/Est.	E/Est.	E/Est and Est (c)	Est (c).
Gold and silver coin and bullion.....	Est (o)	Est (o)	Est (o)	Est (c) and Est (o).

A. Assessments and estimates of percentages of true value made by Census Bureau.

E. Values obtained directly from owners by census enumerators.

E/Est. Values estimated by Census Bureau from information obtained directly from owners.

Est(c). Value independently estimated by Census Bureau.

Est(o). Values independently estimated by other.

TABLE 5.—*Data sources by categories*

Year	Categories	Source
1850	Real and personal property, taxed.....	U.S. marshals.
1860	do.....	Do.
1870	do.....	Do.
	Personal property, not taxed.....	Do.
1880	Real property and improvements, taxed:	
	Farm.....	Census of Agriculture.
	Residence and business real estate including water-power.....	Local taxing authorities and Census Bureau investigation.
	Real property and improvements, exempt.....	No source indicated in report.
	Livestock, whether on or off farms, and farming tools and machinery.....	Census of Agriculture.
	Mines (including petroleum wells) and quarries with 1/2 of annual production.....	Census of Mines.
	Specie.....	Director of the Mint.
	Railroads and equipment.....	Census of Railroads.
	Telegraphs, shipping, and canals.....	Relevant censuses.
	Three-quarters of annual product of agriculture and manufactures and of importation of foreign goods.....	Do.
	Household contents.....	Census Bureau investigation.
	Miscellaneous items, including tools of mechanics.....	Relevant censuses and Census Bureau investigation.

TABLE 5.—Data sources by categories—Continued

Year	Categories	Source
1890	Real property and improvements, taxed.....	Local taxing authorities and Census
	Real property and improvements, exempt.....	Bureau investigation. For public lands, the Commissioner of the Public Land Office.
	Livestock on farms, and farm implements and ma-	Census of agriculture.
	chinery.	
	Machinery of mills, and product on hand, raw and man-	Census of Mines.
	ufactured.	
	Mines and quarries, including product on hand.....	Do.
	Gold and silver coin and bullion.....	Director of the Mint.
	Railroads and equipment.....	Census of Railroads.
	Street railways.....	Do.
1900	Telegraphs, telephones, shipping, canals, and equipment.	Relevant censuses.
	Miscellaneous.....	Census Bureau investigation.
	Real property and improvements, taxed.....	Local taxing authorities and Census
	Real property and improvements, exempt.....	Bureau investigations.
	Livestock.....	Census Bureau investigation.
	Farm implements and machinery.....	Census of Agriculture (1899).
	Manufacturing machinery tools and implements.....	Do.
	Railroads and their equipment.....	Census of Manufacturers (1899).
	Street railways, shipping waterworks, etc.....	Census of Railroads and Census Bu-
	Street railways.....	reau investigation (1904).
1904	Telegraph systems.....	Census of Manufactures, U.S. Navy,
	Telephone systems.....	other Census Bureau information.
	Pullman and other cars not owned by railroads.....	Census of Railroads (1904).
	Canals.....	Census Bureau investigation.
	Privately owned waterworks.....	Do.
	Privately owned central electric light and power stations.	Census of Railroads (1904).
	All other:	Same as 1890 Census of Wealth Valua-
	Agricultural products.....	tion.
	Manufactured products.....	Bureau of Labor.
	Imported merchandise.....	Relevant censuses (1902).
1904	Mining products.....	Census of Agriculture (1899) and
	Clothing, personal adornments, furniture, etc.....	USDA.
	Gold and silver coin and bullion.....	Census of Manufactures (1899).
	Real property and improvements, taxed.....	U.S. Treasury Department.
	Real property and improvements, exempt.....	Census of Mines (1902) and Geological
	Livestock.....	Survey.
	Farm implements and machinery.....	Census of Manufactures (1900) pro-
	Manufacturing machinery tools and implements.....	duction data.
	Railroads and their equipment.....	Director of Mint.
	Street railways, shipping, waterworks, etc.....	Local taxing authorities and Census
1904	Street railways.....	Bureau investigations.
	Telegraph systems.....	Census Bureau investigation.
	Telephone systems.....	Census of Agriculture (1899) and
	Pullman and other cars not owned by railroads.....	USDA.
	Canals.....	Censuses of Manufactures (1899, 1904).
	Privately owned waterworks.....	Census of Manufactures (1904).
	Privately owned central electric light and power stations.	Census of Railroads and Census Bu-
	All other:	reau investigation (1904).
	Agricultural products.....	Censuses of Manufactures, U.S. Navy,
	Manufactured products.....	other Census Bureau information.
1904	Imported merchandise.....	Census of Railroads (1904).
	Mining products.....	Census Bureau investigation.
	Clothing, personal adornments, furniture, etc.....	Do.
	Gold and silver coin and bullion.....	Census of Railroads (1904).
	Real property and improvements, taxed.....	Same as 1890 Census of Wealth Valua-
	Real property and improvements, exempt.....	tion.
	Livestock.....	Bureau of Labor.
	Farm implements and machinery.....	Relevant censuses (1902).
	Manufacturing machinery tools and implements.....	Census of Agriculture (1899) and
	Railroads and their equipment.....	USDA.
1904	Street railways, shipping, waterworks, etc.....	Census of Manufactures (1904).
	Street railways.....	U.S. Treasury Department.
	Telegraph systems.....	Census of Mines (1902) and Geological
	Telephone systems.....	Survey.
	Pullman and other cars not owned by railroads.....	Census of Manufactures (1905) produ-
	Canals.....	tion data.
	Privately owned waterworks.....	Director of Mint.
	Privately owned central electric light and power stations.	
	All other:	
	Agricultural products.....	

TABLE 5.—Data sources by categories—Continued

Year	Categories	Source
1912	Real property and improvements, taxed.....	Local taxing authorities and Census Bureau investigation.
	Real property and improvements, exempt.....	State reports (samples).
	Livestock.....	Census of Agriculture (1909) and USDA.
	Farm implements and machinery.....	Censuses of Manufactures (1899, 1904, 1909).
	Manufacturing machines, tools, and implements.....	Census of Manufactures (1909).
	Railroads and their equipment.....	Interstate Commerce Commission.
	Street railways, shipping, waterworks, etc.....	Relevant censuses and Census Bureau investigation.
	Street railways.....	Relevant censuses (1912).
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Interstate Commerce Commission.
	Canals.....	Census Bureau investigation.
	Privately owned waterworks.....	Bureau of Labor and Census Bureau investigation.
	Privately owned central electric light and power stations.....	Relevant census (1912).
	All other:	
	Agricultural products.....	USDA.
	Manufactures products.....	Census of Manufactures (1909).
	Imported merchandise.....	U.S. Treasury Department.
	Mining products.....	Geological Survey.
	Clothing, personal adornments, furniture, etc.....	Census of Manufactures and U.S. Treasury Department.
Gold and silver coin and bullion.....	Director of Mint.	
1922	Real property and improvements, taxed.....	Local taxing authorities and Census Bureau investigation.
	Real property and improvements, exempt.....	Census Bureau investigation.
	Livestock.....	USDA.
	Farm implements and machinery.....	Census of Agriculture (1920) and USDA.
	Manufacturing machines, tools, and implements.....	Censuses of Manufactures and Poor's & Moody's Manuals.
	Railroads and their equipment.....	Interstate Commerce Commission, State Tax Commission, Moody's Manual.
	Street railways, shipping, waterworks, etc.....	Department of Commerce and Navy Department.
	Street railways.....	Relevant censuses (1922).
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Interstate Commerce Commission.
	Pipelines.....	Bureau of Mines.
	Canals.....	Relevant census (1916).
	Privately owned central electric light and power stations.....	Internal Revenue Service, Census of Gas Works (1919).
	All other:	
	Agricultural products.....	USDA.
	Manufactures products.....	Census of Manufactures (1919) and Commerce Department.
	Imported merchandise.....	U.S. Treasury Department.
	Mining products.....	Census Bureau and Geological Survey.
	Clothing, personal adornments, furniture, etc.....	Census Bureau investigation.
Gold and silver coin and bullion.....	Treasury Department.	

## II. CRITIQUE OF THE CENSUSES OF WEALTH

The potential usefulness of the wealth censuses lies in the analysis of physical wealth through use of valuations of tangible assets. Vagueness of coverage and inaccuracies of the valuations will be discussed. Then the previous findings concerning the combinations of valuation types and inadequacies of categorization will be recalled. On a positive note, possible alterations of the estimates will be indicated. The summary will give an explanation for the inadequacies of the censuses of wealth and make a few suggestions for future wealth measurement by the Government. [Aggregate data from the nine censuses are presented in table 6.]

TABLE 6.—Census Bureau estimated tangible national wealth of the United States, by classes of property

[In millions of dollars]

Census classifications	1922	1912	1904	1900	1890	1880	1870 <sup>1</sup>	1860 <sup>1</sup>	1850 <sup>1</sup>
Total national tangible wealth.....	\$320,804	\$186,300	\$107,104	\$88,517	\$65,037	\$43,642	<sup>2</sup> \$30,069	<sup>3</sup> \$16,160	<sup>4</sup> \$7,136
Real property and improvements, taxed.....	155,909	96,923	55,510	46,325	35,711	20,078	-----	-----	-----
Farms.....	-----	-----	-----	-----	-----	10,197	-----	-----	-----
Residential and business real estate.....	-----	-----	-----	-----	-----	9,881	-----	-----	-----
Real property and improvements, exempt.....	20,506	12,314	6,831	6,313	<sup>4</sup> 3,833	2,000	-----	-----	-----
Livestock and farm implements and machinery <sup>5</sup> .....	8,412	7,606	4,919	4,056	2,703	<sup>6</sup> 2,406	-----	-----	-----
Livestock.....	5,807	6,238	4,074	3,306	-----	-----	-----	-----	-----
Farm implements and machinery.....	2,605	1,368	245	750	-----	-----	-----	-----	-----
Manufacturing machinery, tools and implements.....	15,783	6,001	3,297	2,541	-----	-----	-----	-----	-----
Railroads and their equipment.....	19,951	16,149	11,245	9,036	8,295	5,536	-----	-----	-----
Motor vehicles.....	4,567	-----	-----	-----	-----	-----	-----	-----	-----
Street railways, shipping, waterworks, etc.....	15,414	10,265	4,841	3,495	1,091	419	-----	-----	-----
Street railways.....	4,878	4,597	2,220	1,576	389	-----	-----	-----	-----
Telegraph systems.....	204	223	227	212	-----	-----	-----	-----	-----
Telephone systems.....	1,746	1,081	586	400	<sup>6</sup> 702	<sup>7</sup> 419	-----	-----	-----
Shipping and canals.....	<sup>8</sup> 2,951	<sup>9</sup> 1,491	846	538	-----	-----	-----	-----	-----
Pullman and other cars not owned by railroads.....	545	123	123	99	-----	-----	-----	-----	-----
Pipelines.....	500	-----	-----	-----	-----	-----	-----	-----	-----
Irrigation enterprises.....	-----	361	-----	-----	-----	-----	-----	-----	-----
Privately owned waterworks.....	361	290	275	268	-----	-----	-----	-----	-----
Privately owned central electric stations.....	4,229	2,099	563	403	-----	-----	-----	-----	-----
All other.....	80,262	36,951	20,461	16,851	13,403	13,203	-----	-----	-----
Agricultural products.....	5,466	5,240	1,899	1,455	-----	-----	-----	-----	-----
Manufactured products.....	28,423	14,694	7,409	6,087	-----	-----	-----	-----	-----
Imported merchandise.....	1,594	827	496	425	-----	-----	-----	-----	-----
Mining products.....	730	816	408	327	-----	-----	-----	-----	-----
Clothing, personal adornments, furniture, horsedrawn vehicles, and kindred property.....	39,816	12,752	8,250	6,880	-----	-----	-----	-----	-----
Gold and silver coin.....	4,278	2,617	1,999	1,677	1,159	612	-----	-----	-----
Machinery of mills and product on hand <sup>10</sup> .....	-----	-----	-----	-----	3,059	-----	-----	-----	-----
Mines and quarries with product on hand.....	-----	-----	-----	-----	1,291	781	-----	-----	-----
All other products in hands of producers and dealers.....	-----	-----	-----	-----	-----	6,160	-----	-----	-----
Miscellaneous.....	-----	-----	-----	-----	<sup>11</sup> 7,894	<sup>12</sup> 5,650	-----	-----	-----

<sup>1</sup> Taxable wealth only.  
<sup>2</sup> Currency basis.  
<sup>3</sup> Includes the value of slaves in Southern States.  
<sup>4</sup> Including water power.  
<sup>5</sup> Including livestock not on farms.  
<sup>6</sup> Includes telegraphs, telephones, shipping, and canals and equipment.  
<sup>7</sup> Includes telegraphs, telephones, shipping, and canals.  
<sup>8</sup> Includes \$1,446,000,000 value of ships belonging to U.S. Navy.  
<sup>9</sup> Includes \$402,000,000 in ships of the U.S. Navy.  
<sup>10</sup> Including raw and manufactured products.  
<sup>11</sup> Including clothing, personal articles, furniture, etc.  
<sup>12</sup> Includes tools of mechanics, supplies of food, fuel, etc.

Source of table: Robert R. Doane, "The Anatomy of American Wealth," pp. 260-261.

## QUALITY OF THE VALUATIONS

All valuations used in the censuses of wealth were obtained through the use of assessments and estimates of the percentages of true value that they represent, information obtained directly from owners by enumerators, estimates making use of values so obtained by enumerators, or the independent estimates by the Census Bureau or outside agencies. Each of these methods will be discussed in relation to clarity of coverage and accuracy of the estimates. "Accuracy" of an asset's valuation means its current sales value or the current cost of reproducing an asset performing the same function and having equal market value, based on the individual quantities owned by the relevant economic units,<sup>1</sup> under existing conditions of market structure.

It was found in chapter I that there is very inadequate knowledge of the coverage of the aggregate valuations for 1850, 1860, and 1870, which were derived by the U.S. marshals through combining assessments for real and personal property and adding to those totals an estimate of the proportion of market value that they represented. The tax laws varied, and the extent to which they were enforced or enforcements varied is unknown. Although there is reason to believe that the assessments for real property were more uniform in coverage than those for personal property from locality to locality, this factor is not helpful since the corresponding market values were not given separately and could not be separated unless the assumption was made that each represented the same percentage of true value or some other arbitrary proportion of total true values.

As for the accuracy of the estimates, there is no knowledge of the quality or the degree of uniformity of methods used in making them. Because there is no assurance either of what is included in the estimates or their degree of accuracy, and because the especially dubious personal property valuations were inextricably lumped with those for real property, the 1850, 1860, and 1870 Censuses of Wealth should be treated most circumspectly.

It was also found that there is better clarity and uniformity of the coverage of the real property valuations for 1880 and after because real property assessments tended to be more uniform than personal property assessments and because the Census Bureau was in a better position to even up coverage through its activity of estimating the percentages itself. The methods of the Census Bureau were probably considerably more accurate than those of the individual marshals.

The only probably gross inaccuracy associated with use of assessments for taxation and estimated percentages of the proportion of market value that they represented after 1880 involved first, property with which the assessors were unfamiliar (usually property not ordinarily found in their areas), and second, unusually large swings in the price levels of real property such as those during the late teens and early twenties when it was difficult to obtain enough of an idea of current price levels to ascertain whether or not assessed values kept up. Probably these difficulties along with those associated with using assessments in connection with categorization could have been over-

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<sup>1</sup> Reproduction costs of an asset can vary depending on the amounts of it reproduced, hence the consideration of a quantity on which reproduction costs are based.



come through uniform procedures in assessing. This possibility will be discussed briefly in the summary.

Relative to values obtained from assessments, the coverage of enumerated values is reasonably clear and uniform. However, the enumerated values are subject to possibly enormous inaccuracies.

Whenever it was possible, values obtained directly from owners by census enumerators were used by the Census Bureau for the valuation of personal property. Where enumerated values were available but not directly applicable, they were, where possible, used indirectly as bases for estimates. These indirectly used enumerated values included valuations for other dates which were updated, production figures which were used for the updating and also for estimates of stocks on hand, and earnings figures which were used for capitalization.

The values of the machinery and equipment of manufacturing establishments and the land, buildings, and equipment of large public utility type businesses were obtained directly by census enumerators. In regard to the values given for manufacturing establishments, it has been observed that prior to 1916 when the corporate income tax was introduced and especially prior to 1918 when wartime excess profits taxes were substantial, there was little incentive for companies to keep up an accurate accounting system giving full coverage of their investments and the depreciation charges on them.<sup>2</sup> The result is that the values of manufacturing capital were grossly understated, perhaps so much that the values given in the censuses of wealth are only a small percentage of the actual values. This is also undoubtedly true of the values of farm capital; however, the understatement here is probably not so great because a larger proportion of farm capital was owned by small establishments which tended to have better offhand knowledge of the costs of capital invested. Because of their size the public utilities would probably have had the least accurate knowledge of the costs of their capital invested if most of them were not required to report these costs to the regulatory bodies or to the States in which they were located, for purposes of taxation. However, it has been contended that before regulation became sufficiently strict, public utilities often substantially exaggerated values of their assets.<sup>3</sup>

A further problem, complicating any attempt to express the cost of assets of manufacturing, farming, and large public utility establishments in the relative prices of any one year, is the fact that these values are all book cost; there is no accompanying information concerning the dates of purchase of the equipment.

All indirect uses of enumerated values were especially crude and as a result probably inaccurate. The capitalization of earnings of companies as valuations of them, in using only the earnings of 1 year and a single interest rate, failed to make use of the weighted average of the expected future streams of earnings by the owners and expected future rates of discount corresponding to the market value of company securities. Production figures were used as the basis of an esti-

<sup>2</sup> Paul S. Anderson, "The Apparent Decline in Capital-Output Ratios," *Quarterly Journal of Economics*, vol. 75, No. 4, especially pp. 618-634.

<sup>3</sup> Daniel Creamer, "An Appraisal of Long-Term Capital Estimates, Some Reference Notes," "Output, Input, and Productivity Measurement," *Studies in Income and Wealth*, vol. 25, National Bureau of Economic Research, 1961, p. 433.

mate of stocks on hand for broad heterogenous aggregates of goods; as a result, they provided only the roughest estimates. The error resulting from using values for dates other than those of the censuses of wealth, provided that the values were accurate and the dates reasonably close, is not too great because any changes in value are small relative to the used value. Values for dates between the dates of two enumerations were obtained by taking linear proportions of changes. Sometimes, available information indicated that curvilinear growth had taken place between the figures used, and such information was noted in the text, but not used.

Generally, when related enumerated values were unavailable, the censuses of wealth employed independent estimates made by other agencies or by itself. This form of estimation was seldom used (see table 4). It is difficult to generalize about the estimates made by other agencies; those made by the Bureau of the Mint and by the Department of Agriculture are probably highly accurate; most of the others are probably not.

The estimates made by the Bureau of the Census were often clever and made good use of existing information. However, this information was usually so inadequate as to cast doubt on the accuracy of the estimates. For example, one important category estimated independently by the Census Bureau was real property exempt from taxation. For most States there was scarcely any information at all relating to this category. Consequently the estimates are extremely rough and probably highly inaccurate.

In sum it is believed that on the whole the censuses of wealth rate reasonably well after 1880 on clarity of coverage but rather poorly on accuracy. The estimates of real and personal property before 1880 are probably enormously inaccurate. Thereafter taxed real property estimates are probably much more accurate; it is difficult to determine how much so. The exempt real property estimates are all among the roughest of their respective censuses of wealth. The values for personal property after 1880 have to be treated by categories: those for which enumerated values were used are inaccurate to the extent that owners did not keep accurate records of purchase and depreciation cost and that prices changed in the interval between purchase date and census date. These categories for which enumerated values were used in an indirect way were further inaccurate to the extent the techniques used were inadequate. Some of the independent estimates were probably fairly accurate; most were not.

#### COMBINATIONS OF VALUATION TYPES

It was found in chapter I that the valuations of most of the asset categories of the censuses of wealth fall short of current market values, or for reproducible assets, current reproduction costs, because of combinations of valuation types, and because valuation types were used which were only vague approximations to current reproduction cost or current sales value. The result is that many of the valuations of the censuses of wealth lack clear meaning as they stand.

Some of the combinations consist of values primarily of one type, only partly of another. The values of taxed real property are composed primarily of sales value, cost value contributing relatively a

small amount. The values for manufacturing equipment, farming equipment, shipping, and others are primarily cost, sales values entering only where used equipment purchases were reported by owners (these sales values were roughly comparable to depreciated cost).

Others of the combinations were more complex. The values for public utility type businesses include their lands, buildings, and machinery, the latter two generally at book cost, and the land at market value at some indeterminate time in the past. The values for exempt real property were similarly of mixed type. These more substantial combinations are relatively difficult to characterize as one type. The degree of mixture will be important for determination of the usefulness of the valuation.

#### INADEQUACIES OF CATEGORIZATION

The inadequacies of categorization are similarly variable. Probably the most unfortunate aspect of the continued use of assessments for the valuation of real property in 1880 and after was that the Census Bureau was dependent on the assessing counties for breakdown of the valuations. Examples of desirable breakdowns are separate coverages of: real property and improvements, city and acreage property, residential and business property, the various types of business property, and classes of residential property. All counties in several of the States gave some of the breakdowns, and in those cases and only for those cases are the values so classed. For national figures, however, it would have been necessary for all States to make the desired separations in their reports.

There is no breakdown by types of exempt real property because all estimates of its components were so crude that in each census the Bureau officials felt it was advisable to include them together. As for personal property, the values of equipment of all manufacturing establishments were lumped in the reports, but they could be categorized through reference to the reports of the census of manufactures for years when values of manufacturing equipment were enumerated separately from those for manufacturing buildings and land. For all census years, total value of manufacturing capital including equipment, buildings, and land can be broken down by type of manufacturing establishment. There is a disproportionate categorization of types of public utilities. However, the values for each public utility are not categorized by type of asset with the result that their lands, buildings, and machinery could not be added to those categories for manufacturing, where they are obtainable.

#### ALTERATIONS OF VALUATIONS

An important potential use of the censuses of wealth is based on the comparisons of relative sizes of categories of wealth. This includes comparisons of categories relative to each other at individual censuses with similar proportions for other censuses as well as intertemporal comparisons of sizes of categories of wealth. However, meaningful comparison of categories at individual censuses is limited significantly by the inaccuracies, valuation type confusion, and inadequate categorization. Intertemporal comparisons are further limited through the lack of accompanying data concerning price and quality changes.

Comparisons of valuations which lack clear meaning, because of inaccuracies concerning dates of sale or purchase and mixtures of valuation types, with valuations not lacking clear meaning require an estimate of the extent to which the former valuation deviates from the meaning it most nearly has. However, comparison of valuations, both lacking clear meaning, requires estimates for both; in some cases it may happen that the deviations of both are in the same proportion, perhaps for several censuses. In any case, considerable analysis leading to these estimates would be required before the individual censuses of wealth could permit meaningful comparative analysis of the asset structure of the country.

These remarks apply to the comparison of individual categories of wealth with each other at different censuses. However, the usual problems of price and quality differences must also be attended to for these comparisons to be realized.

As for the inadequate categorization of the censuses of wealth, some additional breakdowns are available in the supporting sources. Those to be found in the censuses of manufactures have already been mentioned. Similar breakdowns are available in the censuses of agriculture. Census data on the public utilities can provide some breakdowns or provide information leading to them. Other desired breakdowns must be estimated. Estimated breakdowns for taxed real property could be facilitated by assessments given by the few States making desired breakdowns. As for exempt property, some States compiled information on values of exempt property by type, which could be used for other States. Several categories of personal property can be further broken down through reference to the sources. One important breakdown which is available in the sources is of the category for manufacturing equipment by types of manufacturing establishment in years when manufacturing equipment was presented separately from total manufacturing capital in the censuses of manufactures (for other years, the estimates could be obtained through taking average proportions of total capital in other years). Breakdown of types of property of the public utility type businesses could be obtained through reports by the companies, State assessments, and available information on specific companies used as samples. Breakdown of categories for household equipment would be too rough. However, breakdowns (and also alterations) of values for gold and silver coin and bullion are readily available from reports of the Director of the Mint for appropriate years.

In general, it is believed that with sufficient adjustment of the values significant use can be made of the relative sizes of asset categories given in the censuses of wealth for the structure of assets of the country at points of time. However, the work outlined would have to be pursued to determine just how true this is.

In order for the aggregate totals of the censuses of wealth to be meaningful, they must be purged of their mixtures of valuation types and aggregations of errors. Furthermore, they must be presented in context with more estimates which can be viewed as meaningful alternatives to the aggregate totals that are currently available. These might include income accounts and sufficient information on price and quality changes to permit comparisons of the totals over time. Cur-

rently the geographical breakdown of totals by States and wealth measurements for other countries<sup>4</sup> serve this purpose.

#### SUMMARY

The potential usefulness of the censuses of wealth for analysis has been shown to be limited because of the inaccuracies and unclear meanings of the estimates and the lack of an adequate categorization for meaningful comparisons of the components of wealth.

It is believed that a large proportion of the individual estimates could be studied, and on the basis of available information estimates could be made of their deviations from meanings desired for them. Furthermore, there is considerable information available which would make possible desirable breakdowns of the census valuations. If these estimates and breakdowns were made on the basis of a carefully thought-out concept of wealth, the censuses of wealth could be used to assist in the analysis of the asset structure of the country in 1880 and subsequent years.

This work could be applied to comparisons of valuations for categories over time. However, the necessary additional analysis of price and quality changes of measured assets would probably be much more difficult to carry out. Because of this it is felt that where it is desirable to use the censuses of wealth for analysis of the growth of and changes in the composition of wealth, attention should be focused on relative sizes of components of wealth at single points of time rather than at different points of time.

The censuses of wealth were not made on the basis of a clearly thought-out concept of wealth based on a consistent objective of what would be measured, and for what purpose. This lack is a fundamental fault, and it should provide a lesson for future wealth estimations. It accounts for most of the inaccuracies found in the valuations and for the lack of meaning and suitable classifications.

It will be noted in chapter III that after 1922 most of the data on which the censuses of wealth were based continued to be collected, and new data sources have been opened. Since that time social accounting concepts have developed considerably. The result is that it is currently possible for all enumerated values to be obtained with social accounting objectives in mind. Enumerators can be instructed to ask specified questions concerning desired meanings of valuations and their breakdowns. This is not so easily done with assessments (if they are desired as bases for valuation rather than enumerations). However, legislation, encouragement, and help by the Census Bureau could probably provide uniformity of assessing techniques by localities giving desired breakdowns of values for real property, consistency of their coverage, and clarity of meaning, if this approach were to be used.

In any event, where available data concerning values of assets do not fit into a clearly thought out and uniform concept of wealth, it is felt that they should either be modified on the basis of independent research to conform with the concept, or not be used. No estimate lacking clear meaning in a social accounting sense belongs in a wealth study.

<sup>4</sup> An example of such wealth measurement is cited in the "Report for the 1900 and 1904 Censuses of Wealth." In a work called "Industries and Wealth of Nations," Michael G. Mulhall, fellow of the Royal Statistical Society, and publisher of Mulhall's Dictionary of Statistics, estimated the wealth of Great Britain and all of the Commonwealth nations, and other countries, presumably for the year 1900.

## III. NOTES ON WEALTH ESTIMATES AFTER 1922

The general characteristics and methods of several important post-1922 wealth studies will be briefly outlined in this chapter. The order in which they are treated will indicate the extent to which they differ from the censuses of wealth in approach; this difference is not necessarily related to the date of the study.

Although the Census Bureau did not publish an integrated measurement of the wealth of the United States after 1922, it and other Federal agencies have continued their collections of relevant data which have improved in scope and method.

The wealth studies discussed here have drawn heavily on these data and to a significant extent their quality depends on them. The Federal Trade Commission (hereafter FTC) and Doane measurements used much the same data as the 1922 Census of Wealth although differences arose where it was possible to correct inconsistencies of the framework of the 1922 Census of Wealth. The National Bureau of Economic Research (hereafter NBER) wealth studies used primarily data collected by the Federal Government although for some of the categories the types of data used differed substantially from those of the censuses of wealth. This is true of all of the work done by Raymond W. Goldsmith, and recently by the Office of Business Economics of the U.S. Department of Commerce.

The treatment of wealth measurements since 1922 given here is very brief, and generally it is only for the purpose of indicating what work has been done and one of the chief sources of its limitations: the lack of consideration given to social accounting objectives in the collection of data.

## FEDERAL TRADE COMMISSION

*Immediate source*

FTC, "National Wealth and Income" (see bibliography for date and publisher of sources cited in this chapter without them). Also, information on the FTC wealth study is available in Doane, "The Anatomy of American Wealth."

*Years covered*

Only 1922.<sup>1</sup> The intent of the FTC work was to improve the framework and consistency of valuation types of the censuses of wealth as far as existing data permitted.

*Categories given*

The principal differences from the categorization of the 1922 Census of Wealth is the addition of a category for public roads, streets, sewers, etc. (excluded by the Census Bureau), and separate categorization of land and improvements for farm real property, industrial, commercial, and residential real property, tax exempt real property, the real property of railroads, and the real property of other public utilities. None of the valuations were distributed by States.

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<sup>1</sup> The National Industrial Conference Board made annual estimates of national wealth for the period 1922-37 using the same categorization as the 1922 Census of Wealth. The estimates were presented in National Industrial Conference Board, "Studies in Enterprise and Social Progress." Explanation of methods and sources was given in "The Conference Board Economic Record," Oct. 5, 1939, vol. I, No. 11, pp. 117-131.

*Valuation types*

The FTC desired to convert all book costs of the 1922 Census of Wealth to current reproduction cost or market values. However, because of problems of data availability, only the valuations for the categories of railroads and their equipment, street railways, telegraph systems, telephone systems, pullman and other cars not owned by railroads, and privately owned central electric light and power stations were altered in this regard.

*Methods and sources*

The separation of values for real property into categories for land and improvements was done through data from the nearly half of all State commissions which assessed them separately; the breakdowns for other States were determined through analogy of conditions in separately assessing States.

An Interstate Commerce Commission (hereafter ICC) study of the reproduction cost of railroads less depreciation was used as a basis for the modification of values of railroads and their equipment and pullman and other cars not owned by railroads. The similar modification of the values for street railroads, telegraph systems, and telephone systems was done primarily on the basis of decisions by State public utility commissions in valuation cases, giving relationships between original costs and current costs.

DOANE

*Immediate source*<sup>2</sup>

Robert R. Doane, "The Anatomy of American Wealth."

*Years covered*

1922, 1930, and 1938.

*Categories given*

The categorizations are essentially the same as that of the FTC estimates. However, residential, commercial, and industrial real property are treated as separate categories. Also, stocks are treated separately as goods for comfort and goods for further production. There are other small differences which vary among the 3 years.

*Valuation types*

The valuations for 1922 were those of the FTC with minor exceptions. The valuation types for 1930 and 1938 vary more than do those of the FTC data especially by the inclusion of more book cost data in the valuations for public utilities.

*Methods and sources*

The 1922 and 1930 estimates were distributed by States; the 1938 values were derived only nationally. The methods of deriving the 1930 and 1938 estimates will first be briefly outlined and then the methods of distribution of the 1922 and 1930 values will be indicated.

<sup>2</sup> Aside from his later work in "Anatomy of American Wealth," Doane developed wealth estimates for census of wealth years through 1904 and for 1909-32 annually in "The Measurement of National Wealth." These were not broken down by States and their categorization and valuation types were much like those of the 1922 Census of Wealth. Their primary interest lies in the data lying behind some of the annual valuations. These include the U.S. Department of Agriculture annual estimates of agricultural wealth from 1909 on, the use of income statistics reported to the Bureau of Internal Revenue for annual estimates of manufacturing wealth, and the availability of ICC and trade association data giving annual valuations of the public utilities.

The sources and methods lying behind Doane's estimates for 1930 were nearly the same as those of the 1922 Census of Wealth. Specifically, Doane made no separate estimates of the values of the public utilities in 1930 as did the FTC in 1922 but used 1932 census data. However, relationships ascertained from the 1922 FTC report were used for the separation of real property valuations into categories for land and improvements on it, and also for the categorization of manufacturing assets.

Different sources and methods were required for Doane's 1938 Wealth Study because of large changes in relative prices over the 8-year period and the lack of census information for the valuation of public utilities and the assets of farms and manufacturing establishments. Assessment ratios had changed rather considerably from 1930 and use was made of studies by the New York Tax Commission, the Brookings Institution, and the University of Iowa for the determination of 1938 ratios. Studies by the NBER and F. W. Dodge Corp. information was used concerning the valuation of tax exempt real property. For the valuation of public utilities, information of the Bureau of Railway Economics, the Bureau of Internal Revenue ("Statistics of Income"), and relationships existing in the previous wealth estimates were used. Manufacturing assets with breakdowns were valued through use of information in "Statistics of Income" and relationships among categories existing in previous wealth estimates. U.S. Department of Agriculture information was used for agricultural estimates. All of the valuations for the assets of public utilities, manufacturing, and agricultural establishments were very rough.

The methods of distributing the values for 1922 and 1930 to the States were generally the same as those of the 1922 Census of Wealth, except where Doane's estimates gave finer breakdowns. These finer breakdowns occurred primarily with the real property valuations and for their distribution "Statistics of Income" and Census Bureau information was used.

#### NATIONAL BUREAU OF ECONOMIC RESEARCH

Wealth estimates sponsored by the NBER discussed here consist in the following studies: Alvin S. Tostlebe, "Capital in Agriculture: Its Formation and Financing since 1870" (1957); Leo Grebler, David M. Blank, and Louis Winnick, "Capital Formation in Residential Real Estate: Trends and Prospects" (1956); Melville J. Ulmer, "Capital in Transportation, Communications, and Public Utilities: Its Formation and Financing" (1960); Daniel Creamer, Sergei Dobrovolsky, and Israel Borenstein, "Capital in Manufacturing and Mining: Its Formation and Financing" (1960); and Simon Kuznets, "Capital in the American Economy: Its Formation and Financing" (1961). Except for Kuznets' work the notes given here have been taken from the following source: Daniel Creamer, "An Appraisal of Long-Term Capital Estimates: Some Reference Notes," in "Output, Input, and Productivity Measurement," vol. 25, "Studies in Income and Wealth." No mention will be made of values for financial assets given in the studies and mentioned in Creamer's notes, except where unavoidable. In general Creamer's notes give much important detail which is glossed over



here; the reader is referred to his notes where such detail is desired. There will be brief mention of the summary work done by Simon Kuznets on the basis of the other NBER capital estimates in "Capital in the American Economy: Its Formation and Financing."

#### AGRICULTURAL CAPITAL

##### *Years covered*

The year 1870 and decennially until 1920 and then quinquennially to 1950.

##### *Categories given*

Separate categories were given for land, buildings, implements, machinery, and livestock with a separate category for horses and mules.

The estimates for the categories were distributed to 10 regions of agricultural significance.

##### *Valuation types*

Separate valuations were given representing current prices and constant (1910-14) prices (also 1929 prices for national totals).

##### *Methods and sources*

All of the current price values except those for agricultural stocks and livestock were census of agriculture enumerated values. U.S. Department of Agriculture estimates were used for livestock. The valuations for stocks on hand were made by Tostlebe on the basis of census of agriculture production figures.

With the exception of those for implements and machinery, the values in constant prices were obtained chiefly through use of enumerated physical unit data, and values existent in base years. The current values reported for implements and machinery were deflated through use of an index of prices paid by farmers going back to 1910, extended backward by linking with an index measuring wholesale prices of goods entering into capital equipment.

#### NONFARM RESIDENTIAL REAL ESTATE

##### *Years covered*

The annual estimates 1889-1953 (figures for 1921-53 are those of BLS-Commerce to be found in Department of Commerce, "Construction and Construction Materials," statistical supplement, May 1950).

##### *Categories given*

Separate estimates are given for structures net of depreciation, including demolished structures, and for land.

##### *Valuation types*

*Structures.* Reproduction cost in current and in constant (1929) prices, less depreciation.

*Land.* Current prices. (See below.)

##### *Methods and sources*

The general method of estimation consisted in cumulating expenditures for new private nonfarm housekeeping and nonhousekeeping dwelling units and for additions and alterations to housekeeping dwelling units from which deductions were made for capital consumption.

The values for expenditures for the construction of nonfarm dwelling units were derived primarily from building permit data developed from work done by the BLS, NBER, and David L. Wickens. Rural values were obtained through Census Bureau population data and the urban values. The Commerce estimates for expenditures on additions and alterations 1889-1920 were extrapolated backward on the basis of relationships with expenditures on construction. Depreciation and demolition rates were derived by the authors of the study. Land values were obtained as proportions of total values of residential real estate through use of FHA appraisal data and tax assessment data from a number of cities which assessed residential real property separately from other real estate.

The cumulated values were added to an estimate of the value of stock existing in 1889. This estimate was based on the Mortgage Census of 1890 and an assumed percentage that mortgages represented of true value.

Price adjustments for 1915-50 were achieved through use of the Boeckh residential construction cost index given in Department of Commerce, "Construction and Building Materials," statistical supplement, May 1951. For prior years this index was extrapolated backward through use of indexes of wage rates in building trades and of building materials prices.

#### REGULATED INDUSTRIES

##### STEAM RAILROADS

###### *Years covered*

Annually 1870-1951.

###### *Categories given*

Road and equipment (sufficient data were presented for derivation of a separate category for land).

###### *Valuation types*

Reproduction cost in current and constant dollars.

###### *Sources and methods*

The method of estimation, as for all regulated industries, consisted in cumulating capital expenditures from which deductions were made for depreciation. The expenditures for 1912-51 were obtained from the ICC expenditure data for class 1 and 2 railroads, raised to the level of all roads through use of book value data. The expenditures for prior years were obtained through sampling of reports of State railroad commissioners, raised to all railroads on the basis of book values. Depreciation rates were obtained through use of ICC data.

The cumulated values were added to an ICC 1937 reproduction cost value for class 1 railroads expressed in 1929 prices. The price adjustments of the depreciation expenditures were achieved through use of an ICC railroad construction cost index 1915-51 extrapolated backward through use of a composite of W. H. Shaw's cost indexes.

## ELECTRIC LIGHT AND POWER UTILITIES

*Years covered*

Annually 1881-1951.

*Categories given*

Plant and equipment, excluding land.

*Valuation types*

Reproduction cost in current and constant (1929) prices.

*Methods and sources*

Capital expenditures minus expenditures on land, 1937-51, were obtained from unpublished data of the Federal Power Commission. The 1921-37 similar capital expenditures were obtained from the statistical bulletins of the Edison Electrical Institute. The values for prior capital expenditures minus depreciation were derived from benchmark values provided by the censuses of electrical industries. No sources were given by the estimators for the assumptions underlying the estimated lengths of life implicit in the capital consumption data.

Price adjustments giving values in 1929 prices for 1911-51 were achieved through use of the Handy Index of Public Utility Construction Costs of Whitman, Requart and Associates, Baltimore, Md. Price adjustments for prior years made use of a composite of several indexes covering electrical equipment, construction materials, and wages in building trades.

## TELEPHONE INDUSTRY

*Years covered*

Annually 1880-1951.

*Categories given*

Plant and equipment, excluding land.

*Valuation types*

Reproduction cost in current and constant dollars.

*Methods and sources*

Gross capital expenditures 1913-51 were obtained from the American Telephone & Telegraph Co., covering all telephone companies. For prior years use was made of changes in annual book values provided by the FCC for the Bell System and of relationships among book values and retirements existing in the A.T. & T. information. The 1880 value to which the cumulated capital expenditures were added was derived from asset figures reported in the 1880 census, adjusted on the basis of FCC data.

Adjustments for expression of the values in 1929 prices were made on the basis of a composite weighted construction cost index, derived from several sources for 1915-51 and extrapolated backwards on the basis of a composite deflator for capital expenditures in the electric light and power industry for those years.

## STREET AND ELECTRIC RAILWAYS AND LOCAL BUS LINES

Creamer did not discuss the estimates for these industries; he felt that they were of especially poor quality because of the paucity of available data on which to base them.

## ALL OTHER REGULATED INDUSTRIES

*Years covered*

Annually 1912-48.

*Categories given*

Separate categories were given for gas, pipelines, and telegraph; motor transportation other than local bus systems; and pullman and express, water transportation, air transportation, water supply companies, irrigation, and radio broadcasting.

*Valuation types*

Reproduction cost in current and constant (1929) dollars.

*Methods and sources*

The capital expenditures 1919 on were obtained from George Terborgh, "Estimated Expenditures for New Durable Goods, 1919-38"; Federal Reserve Bulletin, September 1939, February 1949, and February 1942; Kuznets, "Commodity Flow and Capital Formation," NBER, 1938, and official Commerce-SEC series on capital expenditures. For years before 1919 values of capital expenditures were obtained through interpolation of available benchmarks of industries studied in detail. The capital consumption rates and the deflators for 1929 prices were also derived through detailed study of selected individual industries.

## MINING

*Years covered*

In 1870, 1880, 1890, 1909, 1919, 1929, 1940, 1948, and 1953.

*Categories given*

Total capital (capital and land), capital (plant and working capital), plant (depreciated net value of structures and equipment), and working capital (inventories, cash, and receivables) for all mining and individually for metals, anthracite coal, bituminous coal, petroleum and natural gas, and other nonmetals.

*Valuation types*

Either undepreciated value in current prices as in earlier census reports or book cost net of depreciation.

*Methods and sources*

Values for the period 1870-1919 were obtained from census reports with adjustments where necessary to exclude land values. For the other years the valuations were obtained through use of "Statistics

of Income" and relationships between income and asset valuations existing in earlier census reports. Adjustments for expression of the values in 1929 prices were made separately for equipment, improvements, and working capital. The adjustments for equipment and improvements were derived from Goldsmith and Kuznets data. For working capital, the BLS wholesale price index was used.

#### MANUFACTURES

##### *Years covered*

In 1880, 1890, 1900, 1904, 1909, 1914, 1919, 1927, 1937, 1948, and 1953.

##### *Categories given*

Total capital (land, buildings, machinery and equipment, and working capital (cash, inventories, and accounts receivable)) for all years and fixed capital (total capital minus working capital) for 1890, 1904, 1929, 1937, 1948, and 1953. "These estimates are available for all manufactures, 41 subbranches for the period 1880-1948, and for 18 major groupings for 1948-53."

##### *Valuation types*

Book values, net of depreciation.

##### *Methods and sources*

For the period 1880-1919 the values were taken from the "Census of Manufactures." Thereafter values were derived from the "Source Book" of "Statistics of Income" of the Internal Revenue Service. The balance sheet data from the "Source Book" were adjusted for deconsolidation, unincorporated firms (the IRS data were only for reporting corporations), accelerated depreciation during World War II and the Korean war and the exclusion of intangibles.

All values were given in 1929 prices as well as current prices. Composite indexes were developed for each of 15 major industry groups for the price of machinery and equipment, building costs, and wholesale prices for working capital (in the total capital values). The weights of the three varied by the industry. For prices of machinery and equipment Shaw's price index, Chawner's price index, and Department of Commerce implicit price index for producer's durable equipment were used. For structures, Kuznets and Goldsmith data were used along with a construction cost index of the Turner Construction Co. For wholesale prices, Shaw and BLS series were used.

#### KUZNETS

Professor Kuznets' work provides a set of continuous and comparable estimates of national product and national capital formation over the period 1870-1955. For capital formation, the following

categories are given: Nonfarm residential construction; Government construction; and all other construction; producer's durable equipment; net changes in inventories; and net changes in claims against foreign countries. The national product figures distinguish between capital formation and flows to consumers; the flows to consumers are broken down for services and commodities of varying durability.

The capital formation estimates are presented on a net and a gross basis, in current and in 1929 prices. The post-1919 estimates are on the basis of expenditures given in the censuses of manufactures and other censuses, given each 5 years or less frequently. The sources of these expenditures will not be discussed; they are available readily in the notes to tables R-(408) and (14-16). In general, the data underlying pre-1919 figures are independent of the sectoral estimates; they are considerably less independent for 1919 and subsequent years.

Kuznets' commodity flow estimates provide a broader coverage than the NBER sectoral monographs (including one monograph not here discussed covering public assets: Morris A. Copeland, "Trends in Government Financing" (NBER, 1961)). The overlap consists in nonhousekeeping residential construction, the construction and equipment of trade, construction, finance and service industries, durable capital accumulation of certain nonprofit institutions including trade unions, and benevolent societies, and producer's durable equipment flowing to governments. Kuznets used three flow figures from his "National Product Since 1869" to approximate the overlap: Real estate improvements, other industrial; equipment, other industrial; and equipment, tax exempt.

Comparison of the magnitudes of the sectoral and the commodity flow estimates indicates substantial agreement; however, relatively large differences arise in the patterns of movements of the estimates from period to period. Professor Kuznets prefers the patterns indicated by his commodity flow data for two general reasons. First, like relative errors of stock and flow figures are larger for stocks because the stock figures themselves are larger. Second, stock figures are probably subject to larger relative errors. For example, price adjustments of stocks are different for each of the several years' compounded flows.

#### GOLDSMITH

##### *Immediate sources*

Raymond W. Goldsmith, "A Perpetual Inventory of National Wealth" in "Studies in Income and Wealth," volume 14; "A Study of Saving in the United States," volume III; "The National Wealth of the United States in the Postwar Period."

##### *Years covered*

Volume III of "A Study of Saving" gives annual wealth estimates 1896-1949. In "Postwar Wealth," annual estimates are presented for 1900-58 where the estimates for 1945-49 differ somewhat from those in the previous source.

*Categories given*

In "A Study of Saving," tables W-1, W-4, and W-5, the following categorization is given:<sup>3</sup>

Reproducible tangible assets:

Structures:

Residential nonfarm.

Nonresidential nonfarm.

Mining.

Farm.

Institutional.

Government.

Equipment:

Producer durables.

Consumer durables.

Inventories:

Private:

Livestock.

Crops.

Nonfarm.

Public.

Monetary gold and silver.

Land:

Private:

Residential nonfarm.

Nonresidential nonfarm.

Forests.

Agricultural.

Public.

Net foreign assets.

Tables A-5, A-6, and A-7 in "Postwar Wealth" do not give quite as great a breakdown, but further breakdowns are obtainable from appendix B.

*Valuation types*

For reproducible tangible assets except inventories, original production cost, and reproduction cost in current and constant dollars (1929 prices are used in vol. III of "A Study of Saving" and 1947-49 prices in "Postwar Wealth"). For inventories and land, market values, current and constant dollars are used.

*Methods and sources*

For the valuation of reproducible assets, depreciated expenditures on their construction expressed in current and constant prices were cumulated. Resulting wealth so measured was termed "perpetual inventory" by the author. For each category, expenditure, deprecia-

<sup>3</sup> Specifically excluded from wealth were consumers' holdings of semidurable and perishable commodities, works of art and other collectors' items, military assets (not excluded in "Postwar Wealth" estimates 1945-58), land improvements costs, soil depletion, and subsoil assets.

tion and length of service, and price data were needed. The sources cited here are those given in Goldsmith's article "A Perpetual Inventory of National Wealth," and they do not comprehend specifically the valuations given for 1945-58 in "Postwar Wealth."

#### *Capital expenditures*

The source for capital expenditure data on structures before 1915 was Kuznets' "National Product Since 1869." After 1915, Department of Commerce expenditure series were used. Additions were made to the series from both sources for builders' profits and real estate dealers' commissions. For expenditures on producer and consumer durables before 1929, use was made of W. H. Shaw, "Value of Commodity Output Since 1869," (NBER, 1947). After 1929, Department of Commerce data were used. The Kuznets and Shaw estimates were based primarily on the censuses of manufactures.

Capital expenditures on mining were separately obtained because they were not included in the sources mentioned. Department of Commerce expenditure series were used where available; where they were not available, Commerce output data were used where relationships between output and capital expenditures were assumed; some of these relationships were obtained from the early censuses.

#### *Length of life and depreciation rates*

For goods used by businesses for which depreciation data were available, business accounting methods were used. The length of life data used for these goods were primarily those given by the Bureau of Internal Revenue (Bulletin F, 1942). For one- to four-family houses, consumer durables, public structures, and buildings of type not owned by private business, rough estimates made by the author or other investigators were used. The straight line method of depreciation was employed.

#### *Price level adjustments*

The alternative meanings imparted by price level adjustments are replacement costs or market prices if the assumption holds that construction costs equal market prices when assets are produced. Generally, deflators were used which correspond to the first alternative, although actual construction cost series were used only for structures; market prices were used for producer and consumer durables, semi-durables and perishables but they were at the factory or wholesale level, thus corresponding to costs where redistributive margins were allowed for.

#### *Valuation of inventories*

For the valuation of inventories, book values were used which correspond fairly well to current market price as long as first-in, first-out methods of accounting were used. In later years last-in, first-out methods were becoming important, giving rise to divergencies from current market price; these were not adjusted for by Goldsmith. The book values since 1929 were Commerce data. From 1918 to 1928, they were from Kuznets' "National Income and Its Composition." Before 1918 they were estimated by Goldsmith on the basis of sample values for a few large corporations with adjustments for differences for small corporations and unincorporated businesses. The price level



adjustments were from the same sources except before 1918 when the BLS wholesale price index was used.

#### *Valuation of land*

Values for land were obtained through subtracting accumulated expenditures for structures on it from appraisals of real property by lending institutions.

Urban vacant land was valued on the basis of build-upon land. Farmland values were taken from the censuses of agriculture.

#### *Valuation of net foreign assets*

Cumulated expenditures were on the basis of transfer of ownership of assets to U.S. nationals rather than on their production. Commerce data were used which were not depreciated but adjusted to conform to available benchmarks. Price level adjustments included the 1934 change in the value of dollars relative to gold.

### KENDRICK

#### *Immediate source*

John W. Kendrick, "Productivity Trends in the United States." Professor Kendrick's capital estimates provide a sectorization corresponding to that used for his national product estimates with the exception that there was no breakdown by industry segment within the non-farm sector.

#### *Years covered*

Annual averages for decades, 1869-78 and 1879-88; and 1889-1953 annually for all categories; and 1889-1957 annually for aggregate.

#### *Categories given*

Table A-XV in appendix A gives categories for the national economy (total domestic capital plus net foreign assets); domestic economy (total domestic capital; general government; total private domestic economy; farm assets; private nonfarm residential; and private non-farm nonresidential). Table A-XVI gives breakdowns for the domestic economy and private domestic economy. For the domestic economy, the following categories are given: farm, forest, and park land; structures (including site land); equipment; inventories; and monetary gold and silver. For the private domestic economy: farm and forest land; total structures; nonresidential structures; equipment; and inventories.

#### *Valuation types*

Professor Kendrick's wealth estimates are based largely on previously discussed estimates; the valuation types (current and constant prices) are unchanged.

#### *Methods and sources*

For the net foreign assets the Goldsmith estimates were used. For the general government sector, the Goldsmith estimates were used but were somewhat modified. Also for consistency with national product sectoring, capital stocks held by Government enterprises were roughly estimated for inclusion in the business sector.

(These estimates were subtracted from Goldsmith totals for public capital held by civilian general government.) The Tostlebe capital

stock estimates, supplemented by Goldsmith data were used for the farm sector. The Grebler-Blank-Winnick estimates were used for nonfarm residential property.

#### OFFICE OF BUSINESS ECONOMICS

The work presented in an article titled "Expansion of Fixed Business Capital in the United States" of the November 1962 "Survey of Current Business" will be discussed. This article highlights some of the completed work on capital measurement undertaken by the Office of Business Economics. It presents alternative perpetual inventory estimates on the basis of several different assumptions of economic service life of structures and equipment, depreciation formulas, and bases of valuation for the following: gross stocks, average increases of stocks, net stocks, ratios of net to gross stocks, age composition of gross and net stocks, and service lives of assets. A future work will give considerably more detail and wider choice of the alternative assumptions.

#### *Years covered*

Annual figures for the period 1928 or 1929 (depending on the category) to 1961 were computed. Figures are presented in the article for 1929, 1945, 1949, 1953, 1957, and 1961.

#### *Categories given*

Separate categories are given for structures and for equipment of the following sectors: farm, manufacturing, and other (nonfarm nonmanufacturing). There are subtotals which are not published.

#### *Valuation types*

For each category there are values corresponding to: original cost and current and constant (1954 dollars) reproduction cost. The cost valuations are all depreciated and undepreciated according to varying assumptions.

#### *Methods and sources*

*Expenditures series.*—The following OBE expenditure series were used:

- Residences, farm.
- Residences, nonfarm.
- Nonresidential structures, farm.
- Nonresidential structures, manufacturing.
- Nonresidential structures, all other private business.
- Equipment, farm.
- Equipment, manufacturing.
- Equipment, all other private business.

*Price adjustments.*—Two variants were used: (1) the implicit price deflators for producer's durable equipment and construction prepared for the income and product accounts, and (2) the implicit price deflators for producer's durable equipment and the implicit deflator for nonfarm business GNP in place of the construction deflator. This substitution was used because it was felt that nonfarm business deflators would better represent the output prices of construction. Also a 1-percent addition was made to the first variant for equipment and to the second variant for structures, for quality improvement.

*Lifetime data.*—Seven computations were made: for ages given in Bulletin F (1942 edition) and U.S. Department of Agriculture data for farm components, and 10, 20, and 40 percent longer and shorter. The Bulletin F (and USDA) ages and the 20 percent shorter ages were presented in the article.

*Depreciation.*—The net figures presented were depreciated by straight-line and double declining balance methods. Calculations were also done but not presented for one and one-half and triple declining balance and the sum of the years-digit method.

#### SUMMARY

The wealth estimates covered in these notes indicate that the various agencies of the U.S. Government provide sufficient information for the rough estimation of the value of most assets in the country. However, data obtained by the Federal statistical agencies are not collected with social accounting objectives in mind. The results are that not all forms of wealth are covered, leaving gaps in the wealth estimates; production dates are not given for costs of reproducible assets to provide the basis for revaluation in current prices; and there is often a lack of desirable sectorization and classification of the data.

The obtaining of data suited to national wealth measurement is not so much a matter of expense as it is a matter of the interests and objectives of the data collecting agencies. A Federal involvement in wealth measurement in a well conceived social accounting framework, combined with its already existing data gathering system, would insure the provision of adequate and meaningful data and estimates. Furthermore, wealth estimates in a social accounting framework would be consistent, meaningful, and highly complementary with the national income accounts as a means of deepening macroeconomic analysis.

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APPENDIX I: PART C  
NATIONAL WEALTH MEASUREMENT IN CANADA

By THOMAS K. RYMES  
Carleton University

## NATIONAL WEALTH MEASUREMENT IN CANADA

A program for which the ultimate goal is the development of aggregate national and sectoral balance sheets which would be consistent with the remainder of the social accounting framework is in its early stages at the Dominion Bureau of Statistics. Many of the major categories for such balance sheets are becoming available through the development of directly or closely related projects or have been available for some time from work already well established within DBS. This report will indicate the data which are in progress of development or which are already available.

For purposes of outlining just what categories of national balance sheets are being, or have been, measured, it is useful to set out the standard framework for reference purposes. On a consolidated basis at any one time, national net worth, after adjustment for valuation differences on paper claims, equals the sum of—

(i) the net value of domestic stock of reproducible tangible commodities;

(ii) the net value of the domestic stock of nonreproducible tangible commodities in which individual or communal property rights can be held; and

(iii) the value of net claims on nonnationals.

On a disaggregated or deconsolidated basis, for each sector and for subsectors (e.g., industries within the enterprise sector), there will also have to be recorded the value of paper assets and liabilities (i.e., the value of paper claims on sectors held by a sector and on a sector held by other sectors) with well-known and difficult problems involved in getting consistent valuations for these intra- or inter-sectoral paper claims.

### CONSOLIDATED NATIONAL WEALTH STATEMENTS

The DBS fixed capital stocks project is attempting to prepare estimates of the domestic stock of fixed reproducible capital by industry, following the initial lead of Profs. Wm. C. Hood and A. D. Scott,<sup>1</sup> by means of the familiar "perpetual inventory method."

The level of industrial detail at which estimates are being prepared is illustrated in table 1.

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<sup>1</sup> Wm. C. Hood and A. D. Scott, "Output, Labour and Capital in the Canadian Economy" (Hull: Queen's Printer, 1957), especially ch. 6 and accompanying appendix.

TABLE 1.—Preliminary estimates, fixed capital stocks project by DBS—1948 standard industrial classification—Industrial division and major groups

	Gross stock	Net stock	Net fixed capital formation	Capital consumption allowances
Current dollars.....	X.....	X.....	X.....	X.....
Constant 1949 dollars.....	X.....	X.....	X.....	X.....
Constant 1957 dollars.....	X.....	X.....	X.....	X.....
Original dollars.....	X.....	X.....	X.....	X.....

  

DBS 1948 standard industrial classification industrial divisions and major groups	Construction	Machinery and equipment	Total
I. Agriculture.....		X	
II. Forestry.....	X	X	X
III. Fishing and trapping.....	X	X	X
IV. Mining, quarrying, and oil wells.....	X	X	X
V. Manufacturing.....	X	X	X
Foods and beverages.....	X	X	X
Tobacco and tobacco products.....			
Rubber products.....	X	X	X
Leather products.....			
Textile products.....	X	X	X
Clothing.....	X	X	X
Wood products.....	X	X	X
Paper products.....	X	X	X
Printing, publishing, and allied industries.....	X	X	X
Iron and steel products.....	X	X	X
Transportation equipment.....	X	X	X
Nonferrous metal products.....	X	X	X
Electrical apparatus and supplies.....			
Nonmetallic mineral products.....	X	X	X
Products of petroleum and coal.....			
Chemical products.....	X	X	X
Miscellaneous manufacturing industries.....	X	X	X
VI. Construction.....	X	X	X
VII. Transportation, storage, and communication.....	X	X	X
Transportation.....	X	X	X
Air transport.....	X	X	X
Motor transport.....	X	X	X
Railway transport.....	X	X	X
Urban and suburban transportation systems.....	X	X	X
Water transport.....	X	X	X
Other transport.....	X	X	X
Storage.....	X	X	X
Grain elevators.....	X	X	X
Storage and warehousing.....	X	X	X
Communication.....	X	X	X
Radio and TV broadcasting.....	X	X	X
Telephones.....	X	X	X
VIII. Public utility operation.....	X	X	X
Electric light and power and gas distribution.....	X	X	X
Water and sanitary services.....	X	X	X
IX. Trade.....	X	X	X
X. Finance, insurance and real estate (includes housing).....			
XI. Service.....			
Total all industries.....			
Total business fixed capital as per national accounts.....			
Total public fixed capital as per national accounts.....			

## NOTES TO TABLE I

1. X denotes preliminary estimates for the years 1926-59 now completed.
2. The level of detail at which the estimates are being prepared is not necessarily the level of detail at which the estimates may be published.

The estimates are designed to be conceptually consistent with other parts of the standard Canadian social accounts—in particular, the estimates by industry are designed to relate, on the one hand, to estimates of constant dollar gross domestic product at factor cost by industry while, on the other hand, reassembled to match some conceptual differences in the handling of certain industries, they will be related to constant dollar estimates of business gross fixed capital formation in gross national expenditure data.

The fixed capital stocks project is now concentrated on completing the estimates of fixed reproducible capital by industry, bringing them up to date and experimenting with different assumptions as to average economic lives, methods of depreciation and hypothetical survival curves to see what effect these different assumptions have upon the "perpetual inventory" results. With respect to inventories, by industry, of raw materials, goods-in-process and final goods, such data have become available in a form more useful than book value inventories since the DBS began publishing estimates of the value of physical change in inventories for national product accounts purposes. The fixed capital stocks project should attempt, in the future, to assemble such inventory data by industry and constant and current dollar basis to round out estimates of reproducible tangible capital by industry.

For certain industries, benchmark data are available as a check on the estimates derived from the "perpetual inventory" study. For example, the DBS farm income and expenditure survey gives estimates of the 1958 current dollar value of the net stock of fixed reproducible capital (as well as livestock and poultry) in the agriculture industry<sup>2</sup> with similar data being available from the decennial censuses. With respect to a part of the real estate industry (i.e., that part dealing with the stock of residential reproducible tangible capital), a great deal of information, which is used in preparing the basic estimates of residential capital formation, is available from decennial censuses, and also from the 1958 Farm Income and Expenditure Survey and surveys of consumer finances.

With respect to stocks of commodities held by certain subsectors of the Canadian National Accounts Personal Sector<sup>3</sup> (e.g., farm and non-farm households), there are a number of sources from which partial data are available. The 1960 Survey of Consumer finances<sup>4</sup> obtained information from nonfarm households of the number of automobiles owned for private use as of December 31, 1959, along with other related information. The DBS annual household facilities survey, from a sample survey of selected types of households (farm and nonfarm), provides data on the aggregate number of households having different types of cooking equipment, refrigerators, homefreezers, and a variety of other consumer durables. No systematic attempt within DBS has yet been made to place constant or current dollar valuations on these stock estimates derived from the household facilities survey. In addition, selected city families drawn from DBS surveys of urban family expenditure in 1957, 1959, and 1962, taken in connection with weighting the Consumer Price Index, were asked to report ownership of selected consumer durables and other related information<sup>5</sup> but, again, no systematic attempt within DBS has been made to incorporate these data into a national wealth measurement framework. A number of private researchers have worked with the available data on stocks of consumer goods—with the primary purpose of constructing demand functions for particular types of consumer durables. Prof. A. D. Scott,

<sup>2</sup> DBS, "1958 Farm Survey Report No. 1: Expenditures, Receipts, and Farm Capital."

<sup>3</sup> Certain subsectors of the personal sector (private noncommercial organizations such as churches, universities, etc.), which are treated as associations of individuals, have their capital expenditures included in business gross fixed capital formation and stocks of such capital goods are estimated by the fixed capital stocks project.

<sup>4</sup> See DBS, "Distribution of Nonfarm Incomes in Canada by Size, 1959."

<sup>5</sup> This information has been published for year 1957 only. See DBS, "City Family Expenditure, 1957."



using the "perpetual inventory" method, has attempted tentative estimates of the stock of selected consumer goods for the year 1955 in constant and current dollars.<sup>6</sup>

With respect to the net value of the domestic stock of nonreproducible tangible commodities in which individual or communal property rights can be held, very little work has been done by DBS. Indeed, if one examines the estimates of the net value of natural resources which Prof. A. D. Scott prepared for the Income and Wealth Conference, "The Measurement of National Wealth",<sup>7</sup> one can appreciate just how much more work has to be done in this area in Canada.

With respect to the value of net paper claims on nonnationals, including data on the monetary stock of gold, a great deal of information is available.<sup>8</sup> Although a number of substantial problems remain to be solved (e.g., valuation problems), our data on the value of net claims on nonnationals can be regarded as one of the strongest (in the sense of conceptual consistency, statistical accuracy, and completeness) categories in Canada's consolidated national balance sheet.

#### DISAGGREGATED NATIONAL WEALTH ESTIMATES

Upon deconsolidation of the national balance sheet, the availability of the sectoral or industrial distributions of reproducible and nonreproducible tangible commodities discussed above must be supplemented with data on the value of paper assets and liabilities (i.e., the value of paper claims on sectors held by a sector and on a sector held by sectors).

In terms of sectors rather than industries, annual balance sheets are available for most sectors, excepting the consumer and unincorporated business sectors, from a variety of sources. The Department of National Revenue's "Taxation Statistics" gives annual unconsolidated corporation balance sheets (with certain exceptions such as for chartered banks, Crown corporations, etc.) for the taxation years 1944 to the present. For Crown corporations, life insurance companies, chartered banks, and other financial intermediaries balance sheet data are available from a number of sources, such as supervisory bodies. In 1962, Parliament passed the Corporations and Labour Unions Returns Act, to be administered by the Dominion Statistician, which will require corporations with total net assets over \$250,000 (with the exception of some corporations, such as chartered banks, Crown corporations, etc., now reporting to various administrative boards) to report annual balance sheet and income and expenditure data including a replica of their income tax returns with accompanying assets and depreciation schedules. The act was passed specifically to provide more information on nonresident investment in Canada but authorized DBS personnel will be permitted to have access to detailed corporation state-

<sup>6</sup> A. D. Scott, "Canada's Reproducible Wealth," "The Measurement of National Wealth," editors, R. Goldsmith and C. Saunders, "Income and Wealth, Series VIII" (London: Bowes & Bowes, Ltd., 1959), pp. 193-216.

<sup>7</sup> *Ibid.*, 214. Scott arrived at the following incomplete and extremely tentative estimates for the year 1951:

	<i>Billions of dollars</i>
Municipal land, average of high and low estimates-----	4.5
Forest land-----	2.0
Forests-----	7.0
Minerals, waterpower sites, etc.-----	(?)

<sup>8</sup> See, for example, DBS, "The Canadian Balance of International Payments, 1960, and International Investment Position."

ments. Such authorization will greatly facilitate the implementation of a program of industry statistics on the legal entity reporting unit basis of classification and should be of considerable assistance to (amongst other DBS programs) the fixed capital stocks project.

Data emanating from "Taxation Statistics" and the Corporations and Labour Unions Returns Act suffer from a number of drawbacks in that the data are only available annually with corporations reporting on the basis of their different fiscal years and, more importantly, there is a lack of consistent reporting with respect to the detailed categories of balance sheets.

In 1959, the DBS, following the development of a set of annual national transactions accounts for 1946-54 by the Royal Commission on Canada's Economic Prospects,<sup>9</sup> inaugurated a long-term program which has as its objective the collection of quarterly balance sheet information (from which annual data could be derived) for all parts of the economy except the personal and unincorporated business enterprise sectors. This program is now underway for a number of industries in the incorporated business sector and the consistently related detailed categories of balance sheets for which respondents are asked to report is indicated in table 2. In terms of constructing annual sectoral balance sheets, one of the biggest problems will be the handling of the unrealized capital gains and losses which result when the estimates of current dollar stock of fixed capital, derived from the fixed capital stocks project, are used in place of the fixed assets categories derived from balance sheet statements.<sup>10</sup> In June 1963, publication was begun of quarterly balance sheets for selected financial institutions (trust companies, mortgage loan companies, sales finance and consumer loan companies) and similar data for other financial institutions and nonfinancial corporations will be published when they become available.

TABLE 2.—*Categories of balance sheets for which respondents are asked to report on the DBS experimental quarterly assets and liabilities survey*

ASSETS

1. Cash on hand and on deposit :
  - (a) Canadian dollars :
    - (i) Cash on hand and in chartered banks, including term deposits.
    - (ii) Cash in other institutions, including guaranteed investment certificates.
  - (b) Foreign currency.
2. Accounts receivable: Receivables, including current trade receivables from subsidiary and associated companies; less provision for bad or doubtful accounts.
3. Inventories: Stocks of finished goods, work in progress, raw materials, fuels, and supplies. Gold mining companies should include gold bullion held on the premise and in transit, in inventories.
4. Other current assets: Prepaid expenses, income taxes recoverable, accrued interest, and other current assets not elsewhere included. All investment securities should be included in their respective categories in item 5 below.

<sup>9</sup> See L. M. Read, S. J. Handfield-Jones, and F. W. Emerson, "A Presentation of National Transactions Accounts for Canada, 1946-54," in William C. Hood, "Financing of Economic Activity in Canada" (Ottawa: Queen's Printer; 1959), and also the unpublished paper prepared for the sixth conference of the International Association for Research in Income and Wealth by J. A. Sawyer and F. W. Emerson, "Estimates of Saving Prepared From Financial Transactions Accounts in Canada."

<sup>10</sup> See DBS 61-606, "Business Financial Statistics, Balance Sheets, Selected Financial Institutions," third quarter 1963.

TABLE 2.—*Categories of balance sheets for which respondents are asked to report on the DBS experimental quarterly assets and liabilities survey—Continued*

## ASSETS

5. Investments and advances: Securities held under buy-back agreements should be included under their appropriate investment categories and the total of such securities shown in footnote 1.
    - (a) Investments in Canadian bonds and other forms of indebtedness, other than investments in subsidiary and associated companies, and joint ventures.
      - (i) Short-term notes of finance companies and other unaffiliated Canadian companies.
      - (ii) Government of Canada treasury bills.
      - (iii) Other Government of Canada direct and guaranteed debt.
      - (iv) Provincial and municipal direct and guaranteed debt and Canadian corporate and institutional issues.
      - (v) Other Canadian investments—mortgages, notes, long-term advances, etc.
    - (b) Investments in Canadian preferred and common stocks.
    - (c) Investments in foreign bonds, debentures, treasury bills, stocks, mortgages, notes, long-term advances, etc., other than investments included in item 5(d).
    - (d) Investments in and advances to subsidiary and associated companies, and joint ventures.
  6. Property, plant, and equipment: Machinery, equipment, buildings, land, water rights, mineral resources, timber limits and stumpage rights, etc.; less accumulated depreciation, depletion and amortization. (See footnote 2.)
  7. Other assets: Deferred charges, intangible assets, trust or earmarked funds, and other noncurrent assets.
- Total assets.

## LIABILITIES

11. Short-term loans:
  - (a) Loans and overdrafts from chartered banks in Canadian currency.
  - (b) Other loans payable.
12. Accounts payable:
  - (a) Income and other taxes payable.
  - (b) Other payables, including current trade payables to subsidiary and associated companies.
13. Other current liabilities: Prepayments for goods and services, and other current liabilities not elsewhere included. Exclude long-term debt expected to be paid within 1 year
14. Long-term debt: Bonds, debentures, mortgages and other long-term debt, including funded debt due within 1 year
  - (a) Bonds, debentures and notes.
  - (b) Mortgages and agreements of sale.
  - (c) Loans from chartered banks in Canadian currency including secured loans.
  - (d) Other long-term debt.
15. Other liabilities: Including provision for pensions, guarantees, etc.
16. Accumulated tax reductions applicable to future years: Resulting from capital cost allowances claimed in excess of recorded depreciation and from other causes.
17. Interest of minority shareholders in subsidiaries.

## NET WORTH

20. Paid-in-capital: Share capital plus all contributed or paid-in surplus, such as premium or discount on shares, etc. Unincorporated branches of non-resident corporations should record head office account.
  21. Retained income (or deficit), including reserves.
  22. Appraisals: Excess of appraised value of fixed assets over costs.
- Total liabilities and net worth.

<sup>1</sup> Please state total value of securities held under buy-back agreements.

<sup>2</sup> Please state amount of accumulated depreciation, depletion, and amortization deducted in arriving at item 6.

TABLE 2.—*Categories of balance sheets for which respondents are asked to report on the DBS experimental quarterly assets and liabilities survey—Continued*

## NOTES TO TABLE 2

These general categories are changed or reworded depending upon the industry being surveyed.

Industries currently being surveyed include installment and other finance companies, trust and mortgage loan companies, investment trusts and mutual funds, investment dealers, miscellaneous finance (including insurance agents, real estate finance, and real estate operations) as well as most nonfinancial corporations. It is hoped that within 2 years, work will be underway in areas not now covered, such as insurance carriers and general government.

The Farm Income and Expenditure Survey, discussed above, will provide data on selected paper assets and liabilities for the year 1958 for the agriculture industry and farm households while the two surveys of consumer finances "Incomes, Liquid Assets and Indebtedness of Nonfarm Families in Canada 1955" and "Incomes, Liquid Assets and Indebtedness of Nonfarm Families in Canada 1958," provided data on selected assets and liabilities for nonfarm households.<sup>11</sup> As indicated above in relation to consolidated national wealth measurement, considerable data are available with respect to the net value of claims on nonnationals. But, though some work has been done on the problem of including in assets of the rest-of-the-world sector, nonnationals' share in the retained earnings of domestic corporations, etc., it is safe to say that the revaluation of paper assets and liabilities for that sector to take account of the true net worth lying behind the claims will prove to be a formidable task.

## CONCLUSION

This summary statement of work presently being done in Canada on consolidated and disaggregated national wealth measurement reveals that many components of this part of the standard social accounting framework are now available but that much remains to be done, both in drawing the various pieces of information together and in furthering developmental work in areas not satisfactorily covered at present.

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<sup>11</sup> The last two sources of information on sectoral balance sheets encounter the customary difficulty of segregating assets and liabilities between persons as consumers and as proprietors of unincorporated business enterprises.

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APPENDIX I: PART D  
THE SOVIET CAPITAL STOCK INVENTORY AND  
REVALUATION

By ADAM KAUFMAN  
Economic Consultant

# THE SOVIET CAPITAL STOCK INVENTORY AND REVALUATION

## GENERAL REVIEW

In the last quarter of 1959 a capital inventory and revaluation was carried out in the Soviet Union, covering all state and cooperative enterprises and organizations which were on a self-sustained budget and which were required to set aside allowances for depreciation, with the exception of collective farms. At about the same time a separate housing census was taken providing detailed information on privately owned housing. Two years later, in the last quarter of 1961, a similar inventory and revaluation was carried out in the collective farms and interfarm enterprises operated jointly by two or more collective farms. Thus, only private capital and some administrative institutions supported directly by the state budget were excluded from the comprehensive Soviet censuses of wealth taken in 1960-62.

The Soviet inventories and revaluations of capital had two purposes: first, to revalue all capital stock at its replacement value in terms of July 1, 1955, prices and cost estimates introduced at the beginning of 1956; second, to measure the degree of physical wear-and-tear of this stock as a percentage of replacement value and thus derive the replacement value net of wear-and-tear.

Great importance was attached by the Soviet authorities to the results yielded by the capital revaluation. According to P. Bunich (Pereotsenka osnovnykh fondov i finansovye organy, *Finansy SSSR*, No. 8, 1959, p. 68),

the revaluation of the fixed funds will make it possible:

(a) to determine more accurately the amount and structure of fixed funds in the total national economy, their distribution according to uses and segments of social production, as well as by sectors of the national economy, branches of industry and kinds of production, types of property, geographical distribution and administrative subordination.

(b) to determine more accurately depreciation allowances, working cost of the gross and market values of output, the cost per ruble of the market value of output, the norms (shares) of working capital in goods in processing and in finished goods production, and also to determine more accurately new wholesale prices, profits, and allocations into the funds of the enterprises, and to account and plan more accurately the replacement fund (fond vozmieshcheniia) of the total social product, national income, and the economic efficiency of investment.

(c) to improve the balance sheet of fixed funds, to express accurately their turnover (renovation, discard, readiness (godnost), wear and tear, and their proportions to the working capital, and to determine more accurately the coefficient of technical equipment of labor (pokazatel' tekhnicheskoi voorushennosti truda)).

(d) to attain a uniformity in the evaluation of means of production in different enterprises, to measure more accurately the utilization of fixed funds and the financial effect of their discarding, to straighten out the financing of investment, capital repairs, and modernization of fixed assets and to strengthen economic accounting.

Special emphasis was put on a careful preparation of the general inventory and revaluation, the scope of which had no precedent in the history of Soviet statistics. Over 3 million people participated in carrying out the 1960 census, and over 100 million inventory items were registered by the two inventory revaluations, 1960 and 1962.

In September 1958, a year before the general inventory, a sample registration of machinery and equipment was taken in the 17 most important branches of industry. From May 18 to 22, 1959, an instruction conference was organized by the Central Statistical Administration where the purpose, program, and organizational scheme of the forthcoming census were presented by L. M. Volodarskii, Deputy Director of the CSA, and A. A. Beliakov, Chief of Section of Statistics on Material Supplies and Censuses in the CSA, and others. At this time instructions were also issued in reference to the organization of control works in individual enterprises, the filling out of reports, and a program was elaborated for processing of data yielded by the inventory and revaluation. In June 1959 similar instructional meetings were held for personnel in charge of carrying out the revaluation in Union Republics, krai, oblasti, and regional economic councils (sovnarkhozes). At the same time a network of commissions was organized from Ministries, sovnarkhozes and departments down to individual enterprises and organizations responsible for carrying out the final revaluation.

Fixed capital, or "fixed funds" in Soviet nomenclature, is defined as means of work (in contrast to objects of work which come under the category of working or circulating funds) participating repeatedly in the flow of production, or durable goods of lasting use. Although the definitions of fixed funds differ in different Soviet sources (see P. Bunich, *Pereotsenka osnovnykh fondov*, p. 29, and V. Ostroumov and V. Gorelik, *Organizatsia raboty po pereotsenke osnovnykh fondov*, p. 5; and V. Anisimov and V. Ostroumov, *O metodakh opredeleniia iznosa osnovnykh fondov*, p. 2), all of them emphasize the physical aspects of fixed funds, which are considered as "an aggregation of material objects values" participating in their unchanged material form in many cycles of the productive process, or, in the nonproductive sphere, they are of lasting usefulness. In accordance with the general Marxian approach, these means of labor, or durable goods, have value only when they are themselves products of labor. Land, therefore, and untapped natural resources as "gifts of nature" have no value and price and they are excluded from inventory and revaluation. However, land improvements, amelioration works, permanent plantings, etc., were subjected to the revaluation, insofar as they required labor expenditures.

In order not to glut the inventory and revaluation, fixed funds with a value of less than 50 (new) rubles or a service life of less than 1 year were exempt from inventory and revaluation.

In defining fixed assets the organizers of the census had to draw a line between the notion of fixed and working (circulating) assets. The emphasis put on the physical aspects of assets blurred, in certain cases, the definition of both these types of assets. So, for example, inventories in a machine-building plant are in the category of working and not fixed assets. The same machinery, however, kept in stock, reserve, or repair, in a plant operating this machine is included in the fixed assets inventory. In general, the durability of assets, their repeated

uses in production, their unchanged material form and the longer period in which their depreciation takes place—all these elements were considered essential in defining fixed assets.

With the exception of objects less than 50 rubles in value or a service life shorter than 1 year,<sup>1</sup> all other fixed assets were included in the general inventory, but not all of them were subject to revaluation. First to be exempted from revaluation were assets acquired or installed in the years 1955–59, because their original price, set on the basis of prices introduced July 1, 1955, is identical or close to the replacement price. In addition, two other groups of assets were excluded from revaluation: one consisting of tools and implements with relatively short service lives, whose original and replacement values are not very different, and a second group consisting of assets whose revaluation is difficult. The most important types of assets in the last group are perennial plantings, land improvements, and irrigation works. Also excluded from revaluation were productive and draft livestock, insofar as a special census of livestock had already taken place on January 1, 1959. For the three types of assets listed above the replacement value is the same as the original cost.

Determination of the replacement values of assets was the most important statistical operation in the 1960–62 censuses. In order to revalue the assets, 138 price handbooks have been compiled directly quoting the prices of an all-inclusive assortment of machines, equipment, and rolling stock, including imported machines and equipment no longer produced by the Soviet machine-building industry. For buildings, structures, and transmissions, the handbooks provided “generalized indicators,” estimates of essential elements, as the cost of m<sup>3</sup> of cubature of specific types of buildings, m<sup>2</sup> of their area, the cost of 1 meter of length of water lines, oil pipes, etc., on the basis of which the replacement values were recomputed. In the application of both methods the replacement value is all inclusive: it consists, for equipment, of the wholesale price of July 1, 1955, plus packaging, tare charges, warehousing expenses, expenditures of the equipment foundation, design, and overhead expenditures. Similarly, the estimates of “generalized indicators” in addition to labor and material cost include all other expenditures, as the cost of blueprints, provisional buildings erected on the construction site, and overhead expenditures of the building firms.

The compilers of the 1960 price handbooks adhered strictly to the principle of price identity; i.e., the same replacement price tag was attached to identical equipment and price differentials due to variations of certain types of machinery were in proportion to their measurable performance (capacity, output per time unit, economy in input, etc.). However, in the case of agricultural machines belonging to collective farms this principle of price identity was abandoned: in the 1962 census revaluation, prices of tractors and other agricultural machines and trucks were based not on the 1955 wholesale prices but on new prices introduced February 1, 1961. (See N. Danilov, *Peretsenka mashin, oborudovaniia i transportnykh sredstv i kolkhozakh*, Vestnik Statistiki, No. 5, 1961, p. 66.)

The prices in the price handbooks were set in such a way that they took care of the two types of obsolescence, as they are defined in Soviet

<sup>1</sup> These value and service limits do not apply to agricultural equipment, poultry, and beehives.



literature; i.e., price reductions were introduced, first, due to the lesser current cost of production of a given asset, and second, due to the appearance of new similar assets of greater efficiency.

Such an approach simplified and made easier the next step in the Soviet inventory and revaluation; namely, the measuring of wear and tear. Only physical wear and tear is determined outside of the basic revaluation operation.

The general method of determining the degree of physical wear and tear consists in a direct examination by experts and technicians of a given asset and an estimate of its physical condition and its degree of wear and tear expressed as a percentage of its replacement value. In the case of a complex object, separate judgments were passed on each of its components, the weights of which in the total replacement value of the examined asset are furnished by the corresponding handbook.

Only when a direct physical inspection of an asset was impossible, as, for example, underground water pipes, the degree of wear and tear was determined by comparing elapsed service life, or volume of past output with the "norms" of service life as set forth in special handbooks on rates of depreciation.

The organizers of the censuses were well aware that the method of experts' examination is of necessity subjective and vague. Therefore, in order to formalize the opinions of experts, detailed lists of signs of possible deterioration due to service age of buildings and structures were compiled, which provided the experts with a relatively objective frame of reference as a basis for their estimates.

#### REVALUATIONS OF SOVIET FIXED ASSETS PRECEDING THE 1960 REVALUATION

The first Soviet revaluation of fixed assets on a larger scale was undertaken on October 1, 1925. It was limited to assets of the state industry. The objectives of the 1925 revaluation were similar to those of 1960: to revalue all fixed assets of industry in uniform prices (market prices on October 1, 1925) and to measure the degree of wear and tear. Also similar to the 1960 inventory was the exemption of two groups of assets from the revaluation: assets installed or acquired in the 2 years preceding the revaluation, and assets with relatively short service lives. Equipment kept in stock was also excluded from the revaluation, unlike the 1960 revaluation.

The 1925 industry inventory and revaluation was often in the following years criticized in Soviet literature (see, for example, S. G. Strumulin, *Ocherki Sovetskoi Ekonomiki*, 1928, p. 146 ff.). The critics considered that the prices applied for the revaluation were set exceedingly high by the particular trusts which had a "vested interest" in attaching a high price tag to assets under their supervision, insofar as the depreciation allowances remained at the trusts' disposition. The results yielded by the measurement of the degree of wear and tear were also disappointing. This was determined through a scrutiny of experts, a method, as said before, necessarily vague and subjective.<sup>2</sup>

<sup>2</sup> The 1925 revaluation yielded an average degree of wear and tear in Soviet industrial assets amounting to 37 to 40 percent of their replacement value, while in 1913 the corresponding figure was considered equal to 34 percent. Thus, in 12 years, including civil war destructions and few new investment projects, wear and tear increased only by 3 to 6 percent, which was considered an understatement by Soviet economists (see P. Bunich, *op. cit.*, p. 17).

In 1927-32 a revaluation of fixed assets was carried out in Soviet railroad transportation. This revaluation was taken in prewar 1913 prices, which through a special price index were updated to the year 1928. The results of this revaluation were in general considered unsatisfactory, especially the price coefficient for 1928, which was considered as being set too high.

In the following years partial revaluations were carried out in some sectors of the Soviet economy: In 1935, the fixed assets of the state farms were revalued; in 1937, the capital stock of river transportation; in 1939-40, housing under the jurisdiction of the local Soviets of the RSFSR was inventoried and revalued. In 1940, the fixed assets of the Soviet railroad transportation system were again revalued, and again this time the results were considered inaccurate and not acceptable as book values on the balances.

All prewar revaluations suffered from the lack of a comprehensively determined price system. Some revaluations were carried out in 1936 prices, some in current prices. The same lack of a comprehensive price system had its impact on the postwar, partial inventories and revaluations as, for example, inventories taken in areas occupied by the Germans during the war. Those revaluations were taken in terms of prices in force in the first half of 1941 and did not take account of the postwar inflationary wave. The same applies also to the revaluation of fixed assets of enterprises located in South Sakhalin taken in 1946 and to the revaluation of oil extraction installations of the U.S.S.R. carried out in 1949.

From the point of view of methods applied in the general inventory and revaluation of 1960, of great importance was the revaluation carried out on January 1, 1952, in all flour milling enterprises under the jurisdiction of the former Ministry of the Food Industry of the U.S.S.R. In this particular revaluation special price handbooks were compiled for all kinds of assets found in the flour milling industry. The methods and procedures accepted in this one industry revaluation were so similar to those applied in the 1960 general inventory and revaluation that the 1952 flour milling inventory may be considered as a one-industry sample of the overall revaluation taken 7 years later. All together, 6,000 flour milling enterprises were subjected to the revaluation of their fixed assets and the determination of wear and tear under the supervision of a special Central Inventory Commission. As in the 1960 inventory, a straightforward method was applied in determining the replacement values of machinery any equipment, the values of which were directly quoted in the price handbooks. For buildings and structures, also as in the 1960 inventory, the concept of "generalized indicators"—price quotations of measurable construction parts—was applied. For revaluation, prices of January 1, 1952, were accepted. The accurate results yielded by the 1952 revaluation in the flour milling industry induced the Soviet authorities to adapt methods and procedures applied in this one industry revaluation to the general inventory and revaluation carried out at the end of 1959.

## PREPARATORY MEASURES IN INVENTORY REGISTRATION

From the procedural point of view, the 1960 and 1962 censuses were overall general registrations of fixed capital, carried out through a uniform procedure and methodology in the last quarters of 1959 and 1961, with a time focus set on January 1, 1960 and 1962. For the purposes of registration the census takers relied basically on the current documentation concerning capital stock in all the productive and nonproductive enterprises and organizations. The Soviet bookkeeping and accounting system stipulates that each individual machine and piece of equipment have a technical "passport" which gives a detailed description of technical characteristics, and an inventory card providing data on the service life, time and volume of capital repairs, modernization, etc., of the described item. Less detailed and complete was the inventory documentation for buildings and structures. It goes without saying that the success of the revaluation depended to a large extent on the reliability, accuracy, and completeness of the already existing primary inventory documents. Therefore, as a preliminary step special emphasis was placed on bringing the existing evidence up to date, to fill out omissions, to correct errors in defining fixed funds (quite often some categories of fixed funds were considered as working funds and vice versa), and to complete data concerning technical specifications, original values, and service age of registered items. However, for the sake of simplification and uniformity some changes were made in the current inventory documents. In order to reduce the number of inventory cards (the 1960 census included some 80 million items and the collective farms census another 20 million items), the census instructions recommended doing away with the usually accepted fragmentary definition of an inventory item and applying for the purpose of the general registration a more "integrated" definition.

The regulations on bookkeeping concerning accounts of fixed assets, issued by the Ministry of Finance, January 12, 1955, defined an inventory item as follows:

Finished constructions (ustroistva), objects, or complexes of objects with all attached devices and accessories foreordained for the fulfillment of specific functions appropriate to the given objects.<sup>3</sup>

As a result of such analytical definition, complex equipment was described by many inventory cards, each pertaining to a certain specific part or device of a given machine. So, for example, a rolling press, "mark 500," which in the price handbook is considered as one unit and to which a direct price tag was attached, was covered in the Magnitogorsk metallurgical combine by more than 100 inventory entries.<sup>4</sup> In order to reconcile somewhere the fragmentary approach of the bookkeeping system with the integrating tendency suggested by the census two possibilities were left open: one consisted in revaluating the complex item as an entity, using the price given directly in the corresponding handbook and by applying some adjustment coefficients in cases where the revaluated machines deviate in some parts from the stereotype described in the handbook. Another approach consisted in sum-

<sup>3</sup> A. I. Andreev: O pereotsenke i opredelenii iznosa osnovnykh fondov chernoi metallurgii, *Stal'*, October 1959, p. 950.

<sup>4</sup> *Ibid.*, p. 951.

ming up the prices of basic components of the complex item. The former approach was preferred.

A special emphasis in the preparatory stage was put on bringing the numeration of inventory documents accepted in a given enterprise into accordance with the numeration used later in the census reports. This numeration was to be arranged in such a way that a definite number should pertain to a specific item which could not be repeated or changed until the time of discarding. As an illustration, the following numeration was recommended for machinery and equipment: Industrial machines, 001-199; energy generating machines, 201-299; transportation equipment, 301-399; measuring devices, 601-699; etc. The code number of the group is followed by numbers indicating the quantity of items. (V. Ostroumov, V. Gorelik: *Organizatsia raboty po pereotsenke osnovnykh fondov*, p. 22).

#### THE ADMINISTRATION OF THE PREPARATORY STAGES OF THE CENSUS

All the ministries, departments, and regional economic councils were put under obligations to elaborate a detailed organizational plan which would regulate the following problems: lists of subordinate (ancillary) enterprises and organizations in which the census would be carried out; dates at which blanks, questionnaires, and other documents were to be delivered to the subordinated units; dates for instruction conferences and seminars; arrangements for carrying out partial and sample registration, revaluation and determination of wear and tear; and, finally, procedures and time limits (deadlines) for reception, examination, and confirmation of reports on the results of the census. Similar organizational plans, although on a smaller scale, were to be elaborated by the managements of individual enterprises.

As already mentioned, the main administrative bodies in charge of carrying out the revaluation were specially assigned revaluation commissions organized in all the units subject to inventory and revaluation. The staff of a commission consists usually of the director or manager of the enterprise or organization or his deputy (the chairman of the commission), chief engineer, chief bookkeeper, the head of the investment section, chief electrician, the head of the mechanical department, the head of the planning department, and other specialists. If necessary, specialists and experts outside of the commission's staff might be assigned to work on the census.

It is strongly emphasized by the instructions that in the execution of all three operations of the census (inventory, revaluation, measurement of wear and tear) the commissions should rely basically on physical inspection of the fixed assets under scrutiny and not limit themselves to "paper work," i.e., verification of already existing documents. All the inventory cards (opisi; see section below on reporting blanks and forms) prepared specially for the census should be signed by the chairman of the commission. Differences between the inventory entries in the bookkeeping system and inventory lists prepared for the census should be straightened out by the commission. The commission also bore responsibility for the accuracy and completeness of data yielded by the revaluation and determination of the degree of wear and tear. The activities of revaluation commissions on the level of enterprises were supervised and checked in all stages of their work by the corresponding regional economic councils and ministries.

## CLASSIFICATION OF SOVIET FIXED ASSETS

In classifying fixed assets by types and uses, the census takers basically applied the scheme accepted by the Central Statistical Administration in 1954 in a document titled, "The Typical Classification of Fixed Funds in the National Economy of the U.S.S.R. (except collective farms)."<sup>5</sup> This scheme comprises the following 13 main groups, classified by type:

1. Buildings.
2. Structures.
3. Transmissions (*peredatochrye ustroistva*).
4. Power machines and equipment.
  - Automatic machines.
5. Operating machines and equipment.
  - Automatic machines.
6. Measurement and control devices and laboratory equipment.
7. Transportation equipment.
8. Tools (instrumenty).
9. Productive and household implements and accessories.
10. Draft and productive livestock, other animals, poultry, and apiaries.
11. Perennial plantings.
12. Land improvements, ameliorations, and waterworks.
13. Other fixed capital.

Bunich (*Pereotsenka osnovnykh fondov*, Moscow, 1959, pp. 37 ff) defines each of the above groups as follows:

*Buildings*.—"Constructive-architectural objects built with the purpose of creating conditions for work, housing, rendering social and cultural services to the population, and storing material goods." In accordance with their uses buildings are divided into:

- (a) Buildings for productive purposes (*proizvodstvenno-tekhnicheskogo naznacheniia*).
- (b) Buildings serving material production indirectly (storage, construction, transportation, etc.)
- (c) Buildings providing social, cultural, trade, and other services.
- (d) Residential dwellings.

From the point of view of their structural characteristics all buildings under (a), (b), and (c) are divided as follows:

- (a) Extra-solid brick houses (*osobo kapital'nye kamennye zdaniiia*) with a metal or reinforced concrete frame.
- (b) Ordinary brick houses.
- (c) Lightly built brick houses.
- (d) Wooden structures.

For residential buildings the first three categories remain the same, but the wooden buildings are divided into three subgroups according to the material used and type of construction.

*Structures*.—A very heterogeneous group which, according to Bunich (*ibid.*, p. 87), includes: First, objects serving technical functions not connected with changes in the object of work (coal pits, oil wells, roads, dams, etc.); second, all kinds of pipelines (gas, water, oil); and third, objects providing municipal services.

<sup>5</sup> It should be mentioned that this classification devised for the purpose of accounting differs considerably from a recent classification (Jan. 1, 1963) introduced in connection with new rules for determining depreciation rates for fixed capital. While the former classifies assets according to types and uses, the latter groups them in accordance with their life span and depreciation rate. For the description of the latter classification, see M. Zavallshin and A. Shor: *O novom poriadke planirovaniia i ispolzovaniia amortizatsionnykh otchislenii*, *Planovoe Khozaistvo*, no. 6, 1962, pp. 68-77, and P. Filippov: *O klassifikatsii osnovnykh fondov dlia ischisleniia amortizatsii*, *Planovoe Khozaistvo*, no. 8, 1958.

P. Filippov (Planovoe Khozaistvo, no. 8, 1958, p. 56) presents a detailed list of types of structures, dividing them into the following 15 subgroups:

1. Mining installations.
2. Pressure and control oil and gas wells.
3. Hydrotechnical structures.
4. Underground structures.
5. Bridges of long duration, water pipes and waterworks, water pressure towers, firefighting towers, grain elevators, chimneys.
6. Brick, concrete or reinforced concrete platforms, and storages.
7. Earth surface of railways and highways.
8. Railroad installations, airways, highway installations.
9. Water and sewer systems.
10. Other structures in water and sewer systems.
11. Radio towers and gas holders.
12. Maritime installations.
13. Timber shipping installations.
14. Wooden platforms, bridges, water wells, fences, dirt roads, and other wooden and earthen structures.
15. River installation, transport, regulations, etc.

*Transmission installations* include installations for transporting and transforming of electrical energy. In the reports of the capital stock census they are given together with structures.

*Power equipment* includes all machinery for generating thermal and electrical energy and for transformation of all kinds of energy into mechanical energy. The main types of equipment included in this group are: generators (electric, gas, steam boilers, air compressors), motors (electric, steam engines, steam turbines, mobile steam engines, internal combustion engines), transformers (power transformers, motorgenerators, mercurial rectifiers), distributors (switchboards, oil switches).

Motors attached or built into operating machines, for example, into machine tools, are not included in the power equipment category but are revalued together with the working machine to which they are attached.

*Operating machines and equipment*: From the point of view of the census takers, this is the most important group of fixed funds. It is defined (Bunich, p. 38) as—

machines, apparatus and equipment assigned for mechanical, thermal or chemical effect (vozdeistvie) on the object of work and for its treatment (peremeshchenie) in the productive process through a mechanical motor, by effort of man or animal, and also objects of a containing type (sosudistogo tipa) participating directly in productive process or rendering services.

Devices and instruments permanently attached to operating machines are considered as parts of those machines.

Operating machines are divided into four basic categories: productive machines, auxiliary equipment, lifting, and transporting machinery, and others.

Productive machinery and equipment is used for changing the form, state, or properties of raw materials and semiproducts through their mechanical, thermal, chemical, thermochemical, electrical, electrochemical, chemomechanical or other kind of processing (Bunich, p. 39).

Productive equipment can be again divided in accordance with its function into basic productive machines and others, the function of the latter being to serve the basic equipment as hand operated presses, tanks, etc.

Auxiliary machinery and equipment does not participate directly in the technological process of production; it serves the basic productive process. It includes equipment used for repairs, for production of spare parts, ventilation, sanitary implements, heating units, etc.

The distinction between productive and auxiliary machinery seems to be based not on the technical properties of the inventoried machines but on the administrative division of Soviet industrial and transportation enterprises. The Soviet enterprise is an agglomeration of productive shops (*tsekhy*) where the basic process of production takes place and auxiliary shops such as repair shops, shops for providing spare parts, heat, electric power, steam, etc. Repair works and production of spare parts is done in the Soviet industry basically by shops attached to enterprises, and the cost of repair works and spare parts is relatively high. The regional economic councils have been trying recently to build specialized repair plants and factories of spare parts servicing more than one enterprise of a given kind. The distinction between productive and auxiliary machinery seems to be introduced in order to find out the amount of machinery concentrated in the auxiliary shops of industrial enterprises.

Nonstandardized machinery and equipment, i.e., machines constructed according to individual specifications of a given enterprise, are included in a special group. The price handbooks when possible determined their prices directly, or through an elaborate system of adjustment coefficients, from the price of a similar machine.

*Measurement and control devices and laboratory equipment:* This group includes, first, all kinds of devices for measurement (area, volume, time, temperature, pressure, capacity, intensity, etc.); secondly, regulating mechanisms (electrical, pneumatic, hydraulic, etc.); and finally, laboratory equipment in plant and research laboratories used for quality control and experimentation.

*Instruments:* This group includes mechanized and nonmechanized manual tools and objects attached to machines for processing of material.

*Productive and household implements:* These are benches, anvils, bench clamps, safety devices, packing machines, containers, etc., as well as watches, typewriters, calculating machines, firefighting equipment, libraries belonging to plants, hospitals, etc.

*Transportation equipment:* Means of transporting people and freight by rail, motor, river, sea.

*Livestock, productive and draught; poultry, beehives:* horses, camels, mules, cows, mares, chicken, ducks, etc.

*Perennial plantings:* Manmade (artificial) plantings regardless of age. Included are plantations of fruits, berries, plants for technical purposes, decorative plants, plant nurseries, etc.

*Land improvements and river regulations* (except structures): All kind of amelioration works including landscaping, bush cleaning, forest protection measures, etc.

Each of the 12 groups mentioned was divided into subgroups. A distinction was made between groups of general purpose assets, which are found in more than one sector of the economy or branch of industry, and special purpose assets, which are used only in a specific branch. The Central Statistical Administration prepared lists of specialized assets for the following branches of industry: ferrous

metallurgy, nonferrous metallurgy, coal industry, peat industry, oil industry, gas extraction, chemical industry, power stations, and all basic branches of the food and light industries. In accordance with the character and uses of specialized assets they are broken down into subgroups. So, for example, structures of the coal industry are divided into two groups; surface structures and underground structures. On the other hand, buildings which are found in all branches and spheres of economic activity and which as already mentioned, were divided in accordance with their purpose (buildings for productive uses, buildings indirectly serving material production, buildings for cultural and other nonproductive purposes, and housing), are not reclassified according to specific sectors and branches.

CLASSIFICATION OF FIXED ASSETS BY SECTORS OF THE ECONOMY AND  
BY BRANCHES OF INDUSTRY

Besides the classification of fixed assets by types and uses the Soviet capital stock censuses redistributed them among basic sectors and branches of the economy. This classification was made among the following sectors of the economy:

1. Industry.
2. Construction (including contract and force-account construction and project-making organizations).
3. Agriculture (including forestry).
4. Transportation.
5. Communication.
6. Procurement.
7. Material-technical supply and sales organizations.
8. Trade and public catering.
9. Housing (including hotels and hostels).
10. Municipal services.
11. Public health, physical education, and social insurance.
12. Education, science, arts.
13. Others.

The sector and branch of industry classification was based on an establishment principle: the predominant product, activity or function determines the sector or branch to which the given unit was assigned. It is the peculiarity of the Soviet industrial structure that large industrial establishments have miscellaneous ancillaries. So, for example, larger coal mine enterprises built residential settlements, eating places, farms, etc. A distinction, therefore, is made between the main leading activity of the registered unit and the function of the attached and subordinate economies. The enterprise as such is put in the corresponding sector or branch in accordance with the predominant product or function, but the fixed assets of attached ancillary units are put in their corresponding sectors and branches (see appendix, form No. 1).

In principle, the classification of fixed assets by sectors of the economy and branches of industry disregards administrative attachment and subordination; the decisive criterion is the character, product, or function of the registered unit. A brickyard belonging to a construction firm is put in the industrial sector as well as a vegetable oil press belonging to a state farm. The only exception from this rule seems to apply to means of transportation. Rolling stock and means of transportation belonging to industry, agriculture, and other sectors are classed in the corresponding sectors and not in transportation. The



transportation sector proper includes means of transportation for public use only (transport obshehevo pol 'zovaniia). The same rule applies also to means of communication. (See P. Bunich, *Pereotsenka osnovnykh fondov*, p. 51.)

#### METHODS AND PROCEDURES OF REVALUATION

Revaluation of fixed assets according to their replacement values, accomplished through uniform prices and uniform methods of valuation, was the main purpose of the 1960 and 1962 censuses. Prior to the 1960 census, the values of acquired fixed assets were put in the books according to their original values. Due to the fact that prices of some assets, especially that of machinery and equipment, varied considerably in different periods, this method brought large discrepancies in the book values of identical fixed assets. In the postwar period wholesale prices of machinery and equipment were changed five times and the magnitude of these price movements can be seen from the table below.

TABLE 1.—*Wholesale prices of selected machines in 1949-55*

[Thousands of old rubles]

	Jan. 1, 1949 to Dec. 31, 1949	Jan. 1, 1950 to July 1, 1950	July 1, 1950 to Jan. 1, 1952	Jan. 1, 1952 to July 1, 1955	July 1, 1955 until present
Excavator "E-10003"-----	400.0	290.0	269.7	195.0	131.0
Crane "K-51"-----	193.0	164.5	153.0	108.0	66.0
Loading device "T-61"-----	103.0	60.0	55.8	40.0	25.5
Transporter "T-47"-----	117.0	91.0	84.65	70.0	60.5
Bulldozer "D-159"-----	39.0	28.5	26.5	23.8	20.7
Hustling device "SM-44"-----	46.8	38.0	35.35	32.0	19.6

Source: P. Bunich, *Pereotsenka osnovnykh fondov*, p. 11.

Discrepancies due to price changes made it difficult, on one hand, to determine the amount of depreciation, and hence, the working cost of industrial products, and hindered, on the other hand, comparisons of capital efficiency of investment projects according to their technological levels.

With the exception of machinery sold to the collective farms, the replacement values of all other fixed assets were expressed in wholesale prices of July 1, 1955. Labor cost in construction as well as overhead expenditures (*nakladnye raskhody*) were taken on the level of January 1, 1956.

The census applied two different methods in revaluating fixed assets. For machinery, equipment, instruments, and tools the price handbooks compiled by the Central Statistical Administration quoted direct prices. For these groups of assets the census takers endeavored to reduce to a minimum the necessary computations and adjustments in order to determine the replacement values. A different, indirect method was applied for revaluation of buildings, structures, and transmissions. Here the use was made of "generalized indicators" (price per unit of cubature, area, length, etc., varying according to durability, building material, and accommodations). The series of handbooks concerning those types of assets was compiled by the State Committee on Construction Affairs (*Gosstrois SSSR*) and this method of revaluation required some extensive computations.

## REVALUATION OF MACHINERY AND EQUIPMENT

As already mentioned, some assets were excluded from the revaluation and their original prices were given in the reporting documents. This applied to assets with a relatively short service life, assets whose revaluation was difficult, to productive and draught livestock because their value was established by a partial census in 1958, and to equipment installed or acquired after January 1, 1956, because its original value was already given in price lists of July 1, 1955.

For the purpose of revaluation of machinery and equipment, the whole Soviet Union is divided into five regions (zony).<sup>6</sup> The price handbook quotes the price of a given type of equipment only for the first zone, and the prices for other zones are derived by applying adjustment coefficients which vary in accordance with the type of machine. So, for example, for machinery used in the food industry the adjustment coefficients for location are as follows:

Territorial zone	For machinery requiring assembly	For machinery not requiring assembly
I.....	1.00	1.00
II.....	1.05	1.03
III.....	1.10	1.06
IV.....	1.14	1.09
V.....	1.20	1.11

Source: V. Ostroumov, V. Gorelik: Organizatsia raboty po pereotsenke osnovnykh fondov, p. 46.

For machinery items to which the Soviet planners assigned a higher preference value due to their importance in general economic development, the differentials for location were larger. So, for example, for lifting and transportation equipment the adjustment coefficients were as follows:

Territorial zone	For machinery requiring assembly	For machinery not requiring assembly
I.....	1.00	1.00
II.....	1.10	1.08
III.....	1.18	1.14
IV.....	1.33	1.21
V.....	1.43	1.25

Source: Same as above.

As noted earlier, price handbooks took into consideration obsolescence; i.e., the price of a given machine was reduced when the actual cost of its production was lower than it was in the time when the machine was installed (obsolescence of the first type), or the price reduction was due to an inferior efficiency or performance of the revalued

<sup>6</sup> The first zone comprises the overwhelming part of the Soviet territory. The following provinces (oblasti) are outside the first zone: zone II: The Kazakh S.S.R., Krasnoyarski krai, Arkhangelsk and Murmansk oblasti; zone III: Kirgiz S.S.R., Tadzhik S.S.R., Turkmen S.S.R., Uzbek S.S.R., Buryat-Mongol A.S.S.R., Tuva autonomous province, and Irkutsk oblast; zone IV: Khabarovsk krai, Promorsk krai, Amur and Chita oblasti; zone V: Regions to the north of the Arctic Circle and the Yakutsk A.S.S.R., Kamchatka, Magadansk, and Sakhalin oblasti. (Bunich, p. 113.)

machine as compared to the technical characteristics of a similar machine currently in operation (obsolescence of the second type).

In a case where a given machine was reconstructed or modernized, its replacement value should be determined in accordance with its new capacity. However, if on January 1, 1960, the reconstruction works were still not completed the revaluation should proceed on the basis of technical characteristics before reconstruction.

The price handbooks for equipment included also prices of imported machines and of equipment that had been taken off the Soviet production lines. The prices of imported machines were determined by comparison with similar or analogous machines of domestic production, adjusted when necessary for differences in capacity, efficiency or economy of input (raw material, electricity, labor, etc.). Basically, the same method was applied for prices of machines no longer produced by Soviet industry.

In a case where the efficiency of an imported or obsolete machine (this applies also to unique, nonstandardized equipment utilized in the Soviet economy) is measurable in some natural terms (output in units, meters, kilograms, etc.) or in time units of input of labor (normative hours, normo-chasy), the following formula is applied for revaluation of such machine:

$$V_r = V_m \cdot \frac{P_m}{P_r}$$

where  $V_r$  = replacement value of an imported or obsolete machine;  $V_m$  equals replacement value quoted in the price handbook of a similar domestic or modern machine;  $P_r$  equals productivity of the domestic or modern machine as expressed in natural or time units;  $P_m$  equals productivity of the imported or obsolete machine expressed in the same units. Insofar as the domestic or modern machine taken as a stereotype has a lower cost price now than in the past, with this price still reduced for lower efficiency, both types of obsolescence seem to be taken into consideration by the formula given above.

Example: The grain combine SK-1.2, which is no longer produced by the Soviet machine building industry, is compared with the modern combine SK-2.6 which has a price of 17,500 rubles. The productivity of the former combine is 0.5 ha/h and of the latter 1.5 ha/h. Therefore, the price of SK-1.2 is

$$17,500 \cdot \frac{0.5}{1.5} = 5,833 \text{ rubles}$$

For imported or obsolete freight ships, adjustment is made for differences in current (working) cost per 1 kilogram of traction (tiagi). Here the following formula is used:  $V_r$  equals  $V_m$  by  $W$  by  $C_m/C_r$  where  $V_r$  equals replacement value of the imported or obsolete ship;  $V_m$  equals value of 1 ton of weight of a similar type domestic or modern ship,  $W$  equals weight of the evaluated ship;  $C_r$  equals running cost per kilogram of traction in the prototype ship and  $C_m$  the same in the evaluated ship.

For power equipment, adjustments are made for differences in capacity and for differences in fuel input (in terms of conventional units of fuel kilograms per kilowatt-hour).

Example: The replacement value of an obsolete tractor with a Diesel motor, the traction power of which is 50 HP and which uses 220 grams of Diesel oil per 1 HP/h (or 7.7 kopecks), is determined by comparison with a modern tractor,

capacity 60 HP and input of oil 210 grams per HP/h (7.35 kopecks). In this case the replacement value of the obsolete tractor equals 27.523 rb. when the price of the modern tractor equals 34.600 rb.:

$$34.600 \frac{0.0735 \cdot 50}{0.077 \cdot 60} = 27.523$$

In some specific branches of industry, as for example, in equipment used in thermal power stations, the census takers were forced to abandon at least partially the principle of price uniformity; i.e., that the same prices are applied to identical machines regardless of the size of the productive unit in which they are installed. This was the case in thermoelectrical power stations. For equipment used in such stations two sets of price lists were compiled: one for stations with a capacity below 4,000 kilovolts and another for stations with a capacity of 4,000 kilovolts and over. (See A. Stepanov: *Kak opredeliat' vosstanovitel'nuiu stoimost' oborudovania teplovikh elektrostantsii*, *Vestnik Statistiki*, No. 9, 1959, p. 38-49.)

The share of obsolete machines with a relatively lower efficiency seems to be high in the Soviet economy due to the fact that discarding of wornout machines there takes place on a smaller scale than in other countries with a similar technological level. Hence, the importance of measuring obsolescence, especially obsolescence "type 2" as it is called in Soviet nomenclature. The parameters according to which this obsolescence is measured vary for different types of machines. So for example, those parameters for internal combustion engines are utilization of liquid fuels (in grams) per 1 horsepower; for electric motors, consumption of electricity (kilowatt-hours); for steam boilers, use of conventional fuel per 1 ton of steam of a given temperature and pressure; for steam engines, utilization of fuel per 1 horsepower per hour. For locomotives (steam, diesel, or electrical) the measure for comparison is traction power in tons; for freight cars and trucks, loading capacity in tons; for passenger cars, subway cars, and buses, the number of seats.

It goes without saying that the choice of the "stereotype" plays a paramount role in measuring obsolescence. Unfortunately, no indication can be found in Soviet literature as to how this stereotype is chosen. Is it the most efficient machine of a certain type or use, or the typical, most often utilized machine in a certain sphere of production? The latter seems to be the more probable choice.

For revaluation of complex machines or a system of coordinated machines the guidelines left open two possibilities: One is a separate revaluation of component parts according to prices given by the handbooks and their summation; the other—a more integrated approach—the revaluation of the complex machine as an entity using the price handbook's quotation with corresponding adjustments, in case some components deviate from the components of the stereotype. When possible, the second, "integrated" method of revaluation is recommended for complex machines. However, for lines of automatic machines the replacement value has to be obtained by adding the values of machine tools, electric motors, transmissions, and other devices, as well as the cost of assembly and adjustment (*naladka*) of the line.

## REVALUATION OF BUILDINGS, STRUCTURES, AND TRANSMISSIONS

The heterogeneous character of buildings and structures did not allow the application of a direct method of determining their replacement values as it was used for machinery and equipment. As already mentioned, buildings and structures are revalued on the basis of "consolidated indicators" (ukrupnennyye izmeriteli); i.e., replacement values of basic, measurable elements of buildings and structures, such as the value of 1 cubic meter of the volume of a given type of building, or 1 square meter of its area.

Like handbook prices for equipment, the values of consolidated indicators are inclusive of all the cost components entering into the price of the indicator. So, for example, the cost of 1 cubic meter of cubature of a given type of building includes in addition to the cost of the construction proper, the cost of sanitary and light installations, etc., the cost of technical preparations (blueprints, cost of temporary structures raised on the construction site), as well as the overhead of the building companies.

Prices of building materials and transportation tariffs were those of July 1, 1955, and the cost of labor and overhead expenditures were determined by estimates (normy) promulgated January 1, 1956. Changes in prices which took place after January 1, 1956 were disregarded.

Considering the territorial differentiation of wages of construction workers and differences in prices of building materials, electricity, etc., the whole territory of the Soviet Union was divided into 10 territorial zones and 4 climatic zones. The 10th territorial zone comprises regions to the north of the Arctic Circle and in this zone all the factor prices are raised by 20 percent as compared with an adjoining region.<sup>7</sup>

The four climatic zones were introduced in order to take into consideration differences in construction due to climatic conditions. Considering that the overwhelming number of buildings and structures are located in the climatic zone No. 2, the guidebooks usually give estimates for this zone only and adjustment coefficients for other zones. For some

<sup>7</sup> The 10 territorial zones comprise the following oblasti:

*Zone I:* Belorussian S.S.R., Latvian S.S.R., Lithuanian S.S.R., Moldavian S.S.R., Estonian S.S.R.; Kalmyk A.S.S.R., Mari A.S.S.R., Mordvinian A.S.S.R., Tatar A.S.S.R., Udmurt A.S.S.R., Chuvash A.S.S.R.; Astrakhan, Belgorod, Bryansk, Voronezh, Vladimir, Gorki, Ivanovo, Kalinin, Kaluga, Kaliningrad, Kirov, Kostroma, Kuibyshev, Kursk, Leningrad, Lipetsk, Moscow, Novgorod, Orlov, Penza, Pskov, Ryazan, Saratov, Smolensk, Stalingrad, Tambov, Tula, Ulyanovsk, Yaroslavl oblasti.

*Zone II:* Azerbaidzhan S.S.R., Armenian S.S.R., Georgian S.S.R., Kazakh S.S.R., Ukrainian S.S.R.; Bashkir A.S.S.R., Dagestan A.S.S.R., Kabardino-Balkarian A.S.S.R., North Ossetian A.S.S.R., and Chechen-Ingush A.S.S.R.; Altai krai, Krasnodarsk krai, and Stavropolsk krai; Vologda, Kemerovsk, Kurgansk, Novosibirsk, Omsk, Orenburg, Perm', Rostov, Sverdlovsk, Tomsk, Tiumen (south of the 60th parallel), and Cheliabinsk oblasti.

*Zone III:* Buryat-Mongol A.S.S.R., Irkutsk oblast' (south of the 60th parallel), Krasnoyarsk krai (south of the 60th parallel), Tuva autonomous oblast.

*Zone IV:* Kirgiz S.S.R., Tadzhik S.S.R., Turkmen S.S.R., Uzbek S.S.R., Karelian A.S.S.R., Komi A.S.S.R. (to the south of the Arctic Circle), Krasnoyarsk krai (to the north of the 60th parallel), Arkhangelsk (without the Nenets national region) and Murmansk oblasti.

*Zone V:* Amursk oblast', Primorskii krai, Khabarovsk krai (to the south of the 55th parallel), Tiimensk oblast' (north of the 60th parallel), Chita oblast'.

*Zone VI:* Khabarovsk krai (to the north of the 55th parallel), Evenkiisk national region including Turuchansk "rayon," Irkutsk oblast' (to the north of the 60th parallel).

*Zone VII:* Yakutsk A.S.S.R. (to the south of the Arctic Circle).

*Zone VIII:* Kamchatka oblast' (to the south of the 55th parallel), Magadanskaia oblast' (to the south of the Arctic Circle).

*Zone IX:* Kamchatka oblast' (to the north of the 55th parallel), Sakhalin oblast' (excluding the Kuril Islands).

*Zone X:* Yakutsk A.S.S.R. (to the north of the Arctic Circle), the northern parts of Krasnoyarsk krai, Magadansk oblast', Tiimensk oblast'; the Kuril Islands and the Nenets national region.

regions which are subject to earthquakes and where special arrangements are made to increase stability of buildings, additional "seismic" coefficients are applied.

The main *principium divisionis* in classification of buildings is their "durability" (kapital'nost), a characteristic closely connected with the basic material used in the construction of the building. All buildings used for productive purposes are divided from the point of view of their durability into four categories, residential buildings into five categories. (See annex.) For specific types of buildings as, for example, residential dwellings, adjustment coefficients are introduced for the size of the apartments, heights of rooms, interior improvements, etc.

All together the State Committee on Construction Affairs (Gosstroj) compiled 36 guidebooks and a general introduction in which the basic methodological principles are stated. Specific guidebooks pertain to sectors of the economy or branches of industry. Thus, guidebook No. 1 covers buildings and structures in ferrous metallurgy; No. 2, in non-ferrous metallurgy; No. 3, in coal industry; No. 4, in oil industry, and so on. Guidebook No. 18 explains consolidated indicators applicable to buildings and structures found in different branches and guidebook No. 28 to residential houses, hotels, and dormitories.

The main task of the appraisers (inventory commissions) is to find in the corresponding guidebook the stereotype building or structure which comes as close as possible to the revaluated building and to apply the given values and adjustment coefficients. To facilitate this task some general rules were introduced in reference to certain types of buildings and structures found in specific branches as well to certain categories of residential houses.

For buildings and structures in the coal industry two guidebooks were compiled: No. 3-I for underground structures and 3-II for surface buildings and structures. In contrast to other branches, the underground structures of the coal industry are divided only in six territorial zones and for coal mines located outside these zones corresponding coefficients are given. For surface structures consolidated indicators are introduced according to the material of which they are built, value per 1 ton of steel structures, per 1 cubic meter of concrete or wood, etc.

Guidebook No. 4 presents estimates for buildings and structures in the oil industry. As a rule estimates are given for total complexes. However, if some components of complex installations had been modernized or rebuilt, the guidebook recommended revaluation of each part separately and for this purpose it quoted their prices.

Guidebook No. 5 gives prices and estimates for buildings and structures in the electrical power industry. For thermal stations the building are revalued according to general rules. More complicated are estimates for hydrostations. Here separate estimates are made for each part of the complex construction: value per 1 cubic meter of earthworks, per 1 cubic meter of concrete works in the dam, etc.

To illustrate the methods and procedures used for revaluation of buildings and structures for productive purposes we quote from a Soviet source the following examples (Vestnik Statistiki, No. 7, 1959):

Example No. 1: Revalue a cotton-goods factory located in the Ivanovo oblast'. Building has three stories, an attic, concrete foundation, brick walls, floors of reinforced concrete, a sprinkling installation. Ivanovo is located in the first

territorial zone and the second climatic zone. Price handbook No. 14 indicates that the building in question belongs to the second group of "kapital'nost" and that the value of one cubic meter of cubature of such a building equals 69 rubles plus 3.7 rubles for sprinkling installation, together 72.7 rb. This value is given for the corresponding territorial and climatic zones. Considering that the cubature of the building is 80,000 m<sup>3</sup> the replacement value is derived as 72.7·80,000 equals 5,816 thousand rubles.

Example No. 2: Crane stockade in a factory in the city of Norilsk. Lifting capacity of the crane equals 20 tons. Stockade has 3 spans, 16 meters long, 8 meters high, area equals 3,300 m<sup>2</sup>.

Norilsk is located in the 10th territorial zone and first climatic zone. The replacement value is derived by multiplying 210 rubles (value of 1 square meter of stockade in the adjacent sixth territorial zone and second climatic zone) by 1.2 (coefficient for territorial location) by 1.14 (coefficient for transition from the second to the first climatic zone) and by 3,300 (area of the stockade). The replacement value amounts to 948,000 rubles.

Example No. 3: Assembly shop of a machine building plant in Krasnoyarsk. Foundation and columns of reinforced concrete, brick walls, roofing-plates of reinforced roof iron, flooring—partly tiles, partly (400 m<sup>2</sup>) metal plates. Cubature equals 140,000 m<sup>3</sup>. Crane spans comprise 60 percent of the total area.

Krasnoyarsk is located in the third territorial zone and first climatic zone. The replacement value is derived by multiplying 55 rubles (value of 1 m<sup>3</sup> of volume of such building in the third territorial zone) by 1.08 (adjustment coefficient for transfer from the second to the first climatic zone) times 140,000 (equals cubature in m<sup>3</sup>) plus 200 rubles (increase in value of floor covered by metal plates) times 400 (area of metal floor.) Total equals 8,396 thousand rubles.

Example No. 4: Vertical shaft of coal mine, located in Vorkuta, Komi, A.S.S.R. Depth equals 120 meters; diameter of cross section equals 5 meters; area of cross section equals 19.6 m<sup>2</sup>. Walls of shaft reinforced by concrete 0.4 m thick. Hardness of rock in which the shaft is sunk is unknown. Coking coal is extracted.

The corresponding values as given for the Donbass coal region are 890 rubles of 1 m<sup>3</sup> cut in rock, hardness mark 6-4, and 990 rubles, mark 10-8. Price handbook No. 3 provides that in case the hardness of rock is unknown, 90 percent of it is assumed to belong to mark 6-4 and 10 percent to 10-8. Adjusting the values given for the Donbass region, the replacement value of the Vorkuta coal shaft is derived by the following computation: (890·0.9+990·0.1)·1.04·1.36·19.6·120 equals 2,994 thousand rubles where 890 rb. equals estimate of 1 m<sup>3</sup> cut in rock mark 6-4, 990 rb. the same in mark 10-8; 0.9 and 0.1, the corresponding percentage shares; 1.04 equals adjustment coefficient for mines extracting coking coal; 1.36 equals coefficient for location; 19.6 equals area of cross section in m<sup>2</sup>; and 120 equals depth of shaft.

#### THE DETERMINATION OF WEAR AND TEAR

After the replacement value of a given fixed asset had been established and compared to its original value, the next step of the capital stock census consisted in determining the degree of physical wear and tear. This is measured as the percentage of replacement value represented by wear and tear, and in money terms as the corresponding reduction of this value. Here again, as in the case of determining the replacement value, the census takers did not rely on the book data as given in the current accounting systems. Norms of lifespans for fixed assets as set by regulations concerning depreciation rates were utterly disregarded or used only in exceptional cases. The basic method applied for determination of the degree of physical wear and tear consisted in a thorough physical inspection by experts of a given object and the determination in quantitatively measurable terms the effect of physical forces (rusting, corrosion, etc.) on the inventoried object. The census organizers were aware that such emphasis on expertise leaves too much of a free hand to the experts. In order to formalize the decisions of the experts, the organizers of the census compiled detailed lists of objective characteristics the presence or

absence of which should provide a more objective basis for the decision of the experts. For the same purpose the organizers of the census drew a sharp distinction between degrees of wear and tear proper and obsolescence. The latter was taken care of directly; in the process of revaluation the former had to be determined through a thorough physical inspection.

A committee of experts (engineers, builders, technicians) inspected components or elements of a given asset, estimated in percentages the degree of wear and tear of each part, and by applying specific, guide-book weights, computed a weighted average ratio of wear and tear for the asset as a whole.

In order to avoid arbitrariness in the work of the experts, detailed instructions were elaborated which, on one hand, indicated what should be inspected, and on the other, enumerated the typical symptoms, the absence or presence of which should be considered in order to arrive at a definite judgment. (See annex VIII.)

The following examples illustrate the method of determining the degree of physical wear and tear for specific equipment, buildings and structures:

TABLE 2.—*Equipment: Peat harvester, mark UMPF-4*

Construction parts	Weights given by guidebooks in percent	Value of part according to price book	Percent of wear and tear determined by inspection	Reduction of value
Caterpillar and frame.....	45	13. 410	25	3. 352
Transmission.....	15	4. 470	20	. 894
Bucket elevator.....	20	5. 960	10	. 596
Bunker with mobile bottom.....	20	5. 960	15	. 894
Total.....	100	29. 800	19	5. 736

Dividing 5,736 by 29,800 and multiplying by 100 we obtain the weighted percentage share of wear and tear as equal to 19 percent.

TABLE 3.—*Structure: Water tower*

Components	Weights given by guidebooks in percent	Percentage of wear and tear as determined by inspection	Col. (2) times (1)
	(1)	(2)	(3)
Foundation.....	9	5	45
Walls.....	49	20	980
Floors.....	2	25	50
Windows (proemy).....	2	25	50
Floor foundations.....	4	20	80
Plastering works.....	2	30	60
Sanitary installations.....	10	25	250
Water tank.....	14	15	210
Others.....	8	10	80
Water tower.....	100	-----	1, 805

It follows that the degree of wear and tear of the water tower equals 1,805 divided by 100, or 18 percent of the replacement value of the water tower. (The last two examples quoted from V. Ostroumov, and V. Gorelik, *ibid.*, p. 54 ff.)



For the determination of wear and tear of buildings the instructions recommend utilization of the tables concerning the inventory taking of municipal property issued April 27, 1930 (Instructions of the Central Administrations of Municipalities of the People's Commissariat of Internal Affairs of the RSFSR). These instructions provide ranges (from 0 to 10 percent, 11 to 20 percent, 21 to 30 percent, 31 to 40 percent, 41 to 60 percent, 61 to 80 percent) in accordance with the detection of some typical defects or deterioration due to physical wear and tear of basic components (foundations, walls, roofing, etc.) of a given building. (See annex VIII.)

For assets which cannot be directly inspected, as, for example, underground piping, degree of wear and tear is determined by comparing the elapsed service life with the expected one, or with the "norms" of service life. The following general formula was applied:

$$\text{Wear and tear in percent} = \frac{\text{Years of elapsed service life}}{\text{Years of prescribed service}} \cdot 100$$

In case the elapsed service life, in years, is close to (or exceeds) the normative span of service which would result in a very high percentage (or a negative one) of wear and tear, a different method is provided. The technical inspection first determines the additional number of years in which the given asset or some components may still be in operation, and the following formula is applied:

$$\text{Wear and tear in percent} = \frac{\text{Years of actual service life}}{\text{Years of actual service life plus estimated additional years of service}} \cdot 100$$

In case the actual service life is unknown (the exact date when the asset was installed or put in operation) the degree of wear and tear may be found on the basis of the normative years of service and the anticipated, remaining life span:

$$\text{Wear and tear in percent} = \frac{\text{normative years of service}}{\text{normative years of service plus anticipated additional years of service}} \cdot 100$$

In all the methods applied above the determination of norms of service life is of crucial importance. In the practice of Soviet accounting such norms were introduced in order to determine depreciation rates. Two types of such rates can be discerned: differentiated rates in accordance with the anticipated life span of certain kinds of fixed assets, and average rates for specific branches of industry. In the last two decades, the average rates prevailed and they show little change throughout the years, as can be seen from the table below:

TABLE 4.—Average depreciation rates in selected branches of industry  
[In percent of the initial, book value of fixed funds]

	1938	1950	1955
Ferrous metallurgy.....	5.6	4.8	4.7
Coal industry.....	5.6	4.2	4.2
Oil industry.....	5.6	6.5	5.6
Electric energy.....	5.6	5.3	4.5
Chemical industry.....	5.6	4.5	-----
Machine tool industry.....	5.5	5.6	5.7
Heavy machine building.....	5.5	5.5	5.5

Source: V. A. Vorotilov, op. cit., p. 76 ff.

Compared to the depreciation rates accepted in the American industry the Soviet rates are low. P. Bunich<sup>8</sup> found that the average lifespan of industrial fixed assets in the Soviet Union computed on the basis of the accepted depreciation rates amounts to 37 years, which is 27.5 percent higher than that in American industry.

Therefore, for the purpose of the capital stock census the average rates of depreciation accepted before were of little use.<sup>9</sup> For the purpose of the census a new and very detailed list of lifespans for different kinds and types of fixed assets was compiled and incorporated in the instruction and guidebooks.

From the point of view of the duration of their service life, Soviet fixed assets may be reclassified in the following main groups:

(1) Perennial structures with very low rates of wear and tear, which are submitted to capital repairs (overhaul) at long time intervals (bridges, channels, dams, river regulations, etc.).

(2) Fixed assets periodically renewed through capital repairs of components parts except for the main body (buildings, many kinds of machines, rolling stock, etc.).

(3) Machine and equipment, parts of which, except for the main body, are periodically replaced (looms, tractors, etc.).

(4) Fixed assets which are periodically renewed (restored) in their entity (railroad tracks, some transmission facilities).

(5) Assets, the reproduction of which depends on natural conditions such as cattle, orchards, tea plantations, etc.

(6) Land improvements, ameliorations, irrigations, drainage works, etc.

(Source: V. Ostroumov, V. Gorelik, *ibid.*, p. 52 ff.)

For all fixed assets, the lifespan is established on the assumption that their utilization took place under normal conditions. In cases of more-than-average exploitation of an asset, or when the assets are subjected to natural calamities and so on, the degree of wear and tear is determined by technical inspection, extent of repairs, or other available technical documentation.

#### DOCUMENTS PERTAINING TO THE CAPITAL STOCK CENSUS

Detailed instructions prescribed the uniform procedure for filling out the blanks and forms concerning the capital stock census. These reporting documents can be divided into three main groups. The

<sup>8</sup> P. Bunich: *Amortizatsia osnovnykh fondov v promyshlennosti*, Gosfinizdat, 1957, pp. 115-117.

<sup>9</sup> Due to the fact that the relatively high cost of capital repairs is subtracted from the depreciation of fixed assets, it is admitted by Soviet economists that, in general, the degree of wear and tear is underestimated (see *Finansy S.S.S.R.* No. 8, 1959, p. 68).

first group comprises inventory lists (opisi). These are the primary sources for processing of obtained data. Inventory lists were prepared for the following types of assets: (1) buildings, (2) structures and transmissions, (3) machinery, equipment, and rolling stock, (4) fixed assets excluded from revaluation but included in the determination of the degree of physical wear and tear (e.g., adult draught animals), and (5) fixed assets exempt from revaluation and determination of wear and tear.

The headings in all the inventory lists are identical. They include: name of the enterprise or organization, names of the chairman and members of the inventory commission, date when inventory and revaluation started and when it was completed.

The inventory list for buildings includes the following rubrics:

- A. Ordinal number.
- B. Inventory card number.
- C. Use of building (for productive purposes, housing, trade, cultural, etc.) and its location.
- D. Year in which the building was built or reconstructed.
- E. Short technical description of the building.
  1. Cubature of the building (in cubic meters—outside dimensions).
  2. Total area (in square meters), of which:
    3. Total area of dwellings (in square meters), of which—
      4. Area of living quarters (in square meters).
  5. Original value of the building (in thousand rubles).
  6. Number of the guidebook on the basis of which replacement value was computed.
  7. Number of the table in the guidebook used for revaluation.
  8. Replacement value of 1 cubic meter of cubature according to the quoted table in the guidebook.
  9. Replacement value of the building (in thousand rubles; col. (1) times col. (8)).

#### THE RESULTS OF REVALUATION

10. Increase in value (replacement value over original value).
11. Decrease in value (original value over replacement value).

#### MEASUREMENT OF THE DEGREE OF WEAR AND TEAR

12. Wear and tear as percent of replacement value.
13. Wear and tear in money terms (in thousand rubles; col. (9) times col. (12) divided by 100).

For structures and transmissions the rubrics are similar to those for buildings with the exception that a specific rubric indicates the unit (cubic meter, square meter, linear meter, kilometer, etc.) on the basis of which the revaluation took place and another rubric indicating the replacement value of this unit.

The inventory list for machinery, equipment, and rolling stock includes the following rubrics:

- A. Ordinal number.
- B. Number of inventory card.
- C. Description of inventoried object.
- D. Year when produced or acquired.
- E. Year when installed and, if modernized, when—
- F. Type of mark of equipment.
- G. Short technical description of the object.
- H. Unit of measurement for determination of the replacement value.
  1. Quantity of units of measurement.
  2. Original value of object.

3. Number of quoted price book.
4. Page, or number of entry, or number of table in the price book quoted for the purpose of revaluation.
5. Replacement value on January 1, 1960 (in rubles).

## RESULTS OF REVALUATION

6. Increase in value (replacement value over original value).
7. Decrease in value (original value over replacement value).

## DETERMINATION OF WEAR AND TEAR

8. Degree of wear and tear as percent of replacement value.
9. Wear and tear in money terms (in rubles; col. (5) times col. (8) divided by 100).

Less detailed were the blanks for fixed assets which, although exempt from revaluation, were subjected to the determination of degree of wear and tear. The corresponding blanks included the following rubrics:

- A. Ordinal number.
- B. Number of inventory card (for animals—brand mark).
- C. Denomination of inventoried objects.
- D. Year of acquisition or planting (for draft animals, year of birth).
- E. Short characteristic description of object.
- F. Unit of measurement for establishing the revaluation value.
  - (1) Quantity of units of measurement (size, area, length).
  - (2) Initial value of objects (in rubles).
  - (3) Degree of physical wear and tear in percentage of initial value.
  - (4) Degree of physical wear and tear in money terms (in rubles).

Also short were inventory lists for objects not subjected to revaluation or determination of wear and tear. They consisted of the following rubrics:

- A. Ordinal number.
- B. Inventory number (for animals, brand mark).
- C. Denomination of kind of fixed assets.
- D. Year of acquisition; for animals, year of birth.
- E. Short description of characteristics of object.
- F. Unit of measurement on the basis of which the initial value was determined.
  - (1) Quantity of units of measurement (size, area, length).
  - (2) Initial value on January 1, 1960 (in rubles).

The above described inventory lists (opisi) remained in the files of the inventory commissions. On the basis of the data of the inventory lists reports (otchet) were filled out by the census commissions. All together 56 such report forms were compiled of which form No. 1 included a summary report (svodnyi otchet). Forms No. 2 to 8 referred to fixed assets which can be found in many branches of industry or sectors of the economy, and forms 9 to 56 referred to specific types and kinds of assets found in particular branches and sectors. In order to throw light on the classification of Soviet fixed assets, the titles of the 56 report forms are listed below (quoted from V. Gorelik and A. Monastyrskii: O sostavlenii otchetov po pereotsenke i opredelenii izonsa osnovnykh fondov, Vestnik Statistiki, No. 12, 1959, pp. 50-51).

Form No. 1: Summary report on results of revaluation and determination of wear and tear of fixed assets (see annex I).

Form No. 2: Buildings for productive, cultural, trade, and other purposes except residential (see annex II).

Form No. 3: Residential buildings (see annex III).

Form No. 4: Structures, transmissions, and means of transportation for general use found in many sectors of the economy (see annex IV).

Form No. 5: Metal-cutting machine tools, forging presses, casting and founding equipment, checking equipment, equipment for covering with paint or lacquer, metal, timber sawing and wood processing equipment of general use; automatic lines of machine tools in the machine building industry (see annex V).

Form No. 6: Energy and electrotechnical equipment; pumps and compressors; refrigerative installations; units generating hydrogen and oxygen; electrowelding and gas welding equipment; industrial X-ray installations.

Form No. 7: Machinery for construction, roadbuilding, crushing and pulverizing; equipment for weighting, lifting, and transporting.

Form No. 8: Automobiles, tractors, and structures belonging to the motor transportation system.

Form No. 9: Agricultural machinery, equipment, and structures.

Form No. 10: Specialized equipment, rolling stock, structures, and transmissions of urban passenger transportation (electric power only) as well as specialized equipment of municipal enterprises.

Form No. 11: Specialized equipment of the moving picture industry, film projection, movie studios, film reproduction, theatrical, scenic and photographic equipment (including equipment for production of movie and photo supplies).

Form No. 12: Electronic computers.

Form No. 13: Specialized equipment, instruments, and apparatus for medical purposes.

Form No. 14: Specialized equipment, structures, and transmissions utilized in trade and public catering.

Form No. 15: Specialized equipment, structures, and transmissions for extraction and enrichment of ferrous and nonferrous metallic ores (including extraction of mineral raw materials used in metallurgy).

Form No. 16: Specialized equipment, structures, and transmissions in the ferrous metallurgy industry (including secondary processing, production of metallurgic coke, and production of fireproof material).

Form No. 17: Specialized equipment, structures, and transmissions in the nonferrous metallurgy industry (including output of gold, platinum, and diamonds) as well as secondary processing of nonferrous metals.

Form No. 18: Specialized equipment, structures, and transmissions in the peat industry (including the production of peat briquets).

Form No. 19: Specialized equipment, structures, and transmissions in the oil industry (including main line oil pipes and oil tanks).

Form No. 20: Specialized equipment, structures, transmissions in the gas industry, including extraction of natural gas, production of artificial gas, underground gasification of coal, gas pipes, and gas networks.

Form No. 21: Specialized equipment, structures, transmissions in the electro-technical industry (including cable production) and radiotechnical industry (including electrovacuum equipment).

Form No. 22: Specialized equipment, structures, transmissions for communication, radio, and television.

Form No. 23: Specialized equipment, structures, and transmissions of power stations and electric power net.

Form No. 24: Specialized equipment, structures, transmissions of the chemical industry (including extraction of chemical raw materials except for salt extraction and chemical wood processing).

Form No. 25: Specialized equipment, structures, transmissions of the chemical wood processing and the hydrolysis industry.

Form No. 26: Specialized equipment of the printing industry including the bookbinding industry.

Form No. 27: Specialized equipment, structures, and transmission of timber cutting and wood processing industry (including the match industry).

Form No. 28: Specialized equipment, structures, transmissions of the cellulose paper industry.

Form No. 29: Specialized equipment, structures, and transmissions of the industry of building materials.

Form No. 30: Specialized equipment of the glass, china, and faience industry (including output of medical appliances, chemical and medical glass containers, and of glass fiber).

Form No. 31: Specialized equipment of the cotton goods industry including cotton ginning.

Form No. 32: Specialized equipment of the wool industry (including primary wool processing).

Form No. 33: Specialized equipment of the silk industry (including silk reeling).

Form No. 34: Specialized equipment of the flax and hemp and jute industry (including primary processing of fiber).

Form No. 35: Specialized equipment of the knitted goods industry, and of felt and felt products and artificial furs.

Form No. 36: Specialized equipment of the leather, fur, and shoe industries; leather products, harnesses, bristle products, and brushes.

Form No. 37: Specialized equipment, structures, and transmission of the fish industry (excluding fishing ships and the production of fishing nets).

Form No. 38: Specialized equipment, structures, and transmissions of the meat industry (including meat conserves) and the milk and milk products industry.

Form No. 39: Specialized equipment, structures, and transmissions of the flour and groats milling industry, factories of pressed forage, elevators, including grain elevators.

Form No. 40: Specialized equipment of bakeries, factories of confectioners, macaroni, and yeast.

Form No. 41: Specialized equipment, structures, and transmissions of the vegetable oil, fat, cosmetic, and perfume industry.

Form No. 42: Specialized equipment of the fruit and vegetable processing industry, including conserves, concentrates, food acids, coffee, etc.

Form No. 43: Specialized equipment, structures, and transmissions of the sugar, starch, and molasses industry.

Form No. 44: Specialized equipment, structures, and transmissions of the alcohol, vodka, liquor, wine, beer and soft drinks industries.

Form No. 45: Specialized equipment, structures, and transmissions of the tea, tobacco, and makhorka industries.

Form No. 46: Specialized equipment of all other industries not specified in the forms above.

Form No. 47: Specialized equipment, rolling stock, structures, and transmissions of the railroad transportation, including machines for construction as well as specialized equipment for signals and communication in the railroad transportation system.

Form No. 48: Specialized equipment, structures, and transmissions of air transportation (for civilian use only).

Form No. 49: Oceangoing ships, including those for control and technical purposes and for regulation of navigation.

Form No. 50: Ships belonging to the river transportation system.

Form No. 51: Fish-catching and fish-processing ships.

Form No. 52: Specialized port accommodations and structures; installations for navigation, including docks, repair shops, and dockyards.

Form No. 53: Stadiums and other sport structures and special sporting equipment.

Form No. 54: Rolling stock, specialized equipment, structures, and transmissions of the subway transportation system.

Form No. 55: Specialized equipment, structures, and transmissions of the salt extracting industry.

Form No. 56: Specialized equipment, structures, and transmissions of the coal and shale extracting industries as well as special equipment for geological prospecting.

As can be seen from the titles of the forms listed above, the census takers made a special effort to obtain detailed information on the so-called specialized equipment, i.e., machines used only in specific branches of industry or sectors of the economy. It seems doubtful whether the detailed instructions succeeded in preventing some overlapping of specialized equipment with equipment for general purposes registered in the forms 4 to 8.

In the process of filling out the blanks, special attention is drawn to the coding of specific kinds of fixed assets in order to facilitate the

mechanical processing of data. Only coding concerning types and kinds of fixed assets has to be accomplished by the census commissions, while codes for territorial distribution, administrative jurisdiction, distribution by sectors and branches are to be filled out by the organization to which the registered enterprise is subordinated. As already mentioned, fixed assets of an establishment which produces more than one product are classified according to the prevailing product.

In all the reporting blanks, with the exception of forms 2 and 3, the numerated columns are identical and have the same numeration. The reporting document consists mainly of seven columns with the following headings:

1. Original book value before revaluation as of January 1, 1960 (in thousand rubles).
2. Total replacement value after revaluation as of January 1, 1960 (in thousand rubles).
3. New fixed assets (built or acquired in the period from January 1, 1956 to January 1, 1960) revaluated according to book value.

#### RESULTS OF THE REVALUATION

4. Markup (+) excess of replacement value over book value.
  5. Markdown (—) excess of book value over replacement value.
  6. Degree of physical wear and tear, determined in the process of revaluation, in money terms (thousand rubles).
  7. Degrees of physical wear and tear in percentage of the replacement value.
- Forms 2 and 3 in addition to the above columns required information on volume and area of the registered buildings.

The instructions advise that all computed data should be rounded to the whole unit of measurement, as, for example, to thousand rubles, 1 kw, cubic or square meter, ton, etc. No fractions or digits should be put in the blanks and formulas.

A third distinct group of the general registration documents consists of blanks pertaining to summarized reports which are filled out by regional economic councils (sovnarkhozy), ministries and departments. Five forms belong in this category. They are as follows:

1. Form SP: "Summary report on results of revaluation and determination of wear and tear of fixed funds." It includes all fixed funds under the jurisdiction of a ministry, department, sovnarkhoz trust, etc. This form is compiled on the basis of forms No. 1 of subordinated enterprises and, in case of ministries and sovnarkhozes, on the basis of SP blanks of subordinated trusts and departments and forms No. 1 of establishments directly attached to the reporting agency.
2. Form SPO-1: "Summary report on results of revaluation and determination of wear and tear according to sectors of the economy or branches or kinds of industry." This form regroups the data by sectors of the economy and types of assets, or by branch and subbranch of industry and type of assets.
3. Form SPO-2: Summary report on results of revaluation and determination of wear and tear by sectors of the national economy (without the regrouping of assets by type).

These three summarizing blanks are constructed in such a way that they correspond to the three basic sections of the reporting form No. 1 (see annex). Data in form SP are taken from reporting form No. 1—summary part, SPO-1 from form 1, section II, and SPO-2 from form 1, section III.

4. Form SPO-3: "Summary report on results of revaluation and determination of wear and tear of fixed funds by branches of industry and kind of output." This form is filled out only by the Statistical Agencies of Union Republics on the basis of forms SPO-1 of subordinated administrative units and, in case some establishments are directly subordinated to the Republican administration, from

form No. 1, section II of the corresponding enterprises. This applies mainly to enterprises managed by committees of local Soviets (Ispolkomy Sovietov Deputatov Trudiashchichsia).

5. Form SPR: "Summary report on results of revaluation and determination of wear and tear of fixed funds by geographic distribution (territories)." Here oblast' is the main administrative unit. Form SPR is filled out by trust and oblast' departments. In case enterprises attached to a given trust are located in more than one oblast', the trust compiles forms SPR separately for each oblast'.

The main task of processing the obtained data and the preparation of summarized reports on specific aspects (type, branch, territory, administrative subordination) is put on the Union Republics Statistical Agencies. On the basis of the Union Republics summarized results of the registration, the Central Statistical Administration of the U.S.S.R. compiles data for whole territories and the total national economy.

#### CAPITAL REVALUATION IN THE COLLECTIVE FARMS

Two years after the general inventory and revaluation of fixed assets in the Soviet state and cooperative enterprises and organizations, a similar operation was carried out in the cooperative sector of the Soviet agriculture, in the collective farms (kolkhozes). In addition to 40,500 of kolkhozes this census covered some 5,000 of "interkolkhozien" enterprises, being the joint property and under the joint management of 2 or more kolkhozes.

Due to the poorer state of accounting and to some specific conditions in the Soviet cooperative agriculture, this census encountered special difficulties and required a most thorough preparation.

The main administrative body charged with the responsibility of carrying out the census was the district (rayon) executive committee (rayispolkom). In each rayon a special commission has to be organized, consisting of the chairman of the rayispolkom as the chairman of the commission, a representative of the local (rayon) inspectorate of the Central Statistical Administration and employees of local state farms and industrial enterprises who have already acquired some experience in carrying out the general inventory. (See A. Kochev: *Kak organizovat' v kolkhozakh pereotsenku osnovnykh fondov*. Vestnik Statistiki, No. 4, 1961, pp. 64 ff.)

The timetable in preparation and execution of the collective farms census was as follows:

(1) Before May 1, 1961, the primary inventory documentation and technical description of all fixed assets belonging to collective farms should be put in order and brought up to date.

(2) During April-May 1961 the rayon commissions should check the preparation work of the corresponding commissions in each collective farm and in interfarm organizations. During the same time all the farms should be provided with instructions, price handbooks, and necessary blanks and formularies.

(3) In June-July 1961 a sample revaluation and determination of wear and tear of different types of fixed assets should be carried out in each of the collective farms.

(4) From August to November 1961 the revaluation proper and the determination of the degree of wear and tear has to be completed.

(5) During the month of November the obtained data in the collective farms should be checked and verified by the supervising commission. Reports on revaluation and determination of wear and tear of a fixed assets by the collective farms should be sent to the rayispolkom not later than January 15, 1962.

(6) Checked and approved by the rayispolkom commissions, the reports of the kolkhozes should be sent to the Central Statistical Administration not later than January 25, 1962.



The basic methods and procedures applied in the collective farms census were similar to those applied in the 1960 general revaluation. But in one aspect the two censuses differ: In contrast to the evaluation of agricultural equipment in the state farms based on wholesale prices of July 1, 1955, the prices of equipment belonging to collective farms were higher on the level of February 1, 1961 (see *Vestnik Statistiki*, No. 5, 1961, p. 66). Thus, the principle of price identity, i.e., the attaching of identical price tags to identical machines, was in this particular case discarded.

Smaller in scope than the general capital stock census, the collective farms inventory and revaluation was still a major statistical operation. All together some 45,000 collective farms and interfarm organizations were registered and the inventory included over 20 million inventory items (*L. Volodarskii: Itogi pereotsenki osnovnykh fondov kolkhozov, Planovoe Khozaistvo*, No. 11, 1962, p. 48).

#### REVALUATION OF EQUIPMENT AND MEANS OF TRANSPORTATION

The organizers of the census endeavored to simplify as far as possible the necessary computations in order to determine the replacement values of equipment belonging to collective farms. While in the 1960 census over 100 price handbooks were compiled for equipment alone, in the collective farm sector only 6 price handbooks were issued. They were as follows (see *Vestnik Statistiki*, No. 5, 1961, p. 65):

Price handbook No. 1: Agricultural machinery and equipment, means of transportation, lifting equipment, and balances.

Price handbook No. 2: Equipment for repairs and general industrial use (including machinery for construction, road building equipment, excavators, scrapers, bulldozers, graders, concrete mixers, etc.).

Price handbook No. 3: Energy and electrotechnical equipment.

Price handbook No. 4: Equipment for processing of agricultural products belonging to subsidiary enterprises attached to collective farms or interfarm organizations.

Price handbook No. 5: Equipment of telephone stations, cultural, medical, and other centers servicing the collective farms.

Price handbook No. 6: Ships in fishermen's collective farms (motorized and nonmotorized).

The price handbooks were compiled in such a way as to reduce the additional computation to a minimum in order to determine the replacement value. As in the 1960 census, the prices quoted directly in the price handbooks are all inclusive. So, for example, when a given machine is installed on a given foundation the replacement value of the foundation is included in the price of the machine. However, in case the basic technical characteristics of a given machine diverge from the parameters of a stereotype (the closest similar machine as described in price handbook), some price adjustment should be made in accordance with the "basic technical indicators" (*osnovnye tekhnicheskie pokazateli*). These quantitatively determined differences in capacity performance, etc., vary for different kinds of machines. So, for example, for tractors the basic indicator is considered to be the traction power in HP; for plows and combines, the width in meters; for winnowers, output in tons per hour; for vans, cubature in tons; for trucks, loading capacity in tons, etc.

## REVALUATION OF BUILDINGS AND STRUCTURES

The determination of replacement values for buildings and structures in the collective farms sector was a simplified version of the method applied in the 1960 census. The four instruction books compiled by the Gosstroj of the U.S.S.R. were as follows:

Handbook No. 1: Generalized indicators of values for buildings and structures for productive purposes (including buildings of auxiliary enterprises, water supply and sewerage works, roads and bridges).

Handbook No. 2: Generalized indicators of values of residential buildings, for cultural and administrative purposes.

Handbook No. 3: Generalized indicators of values of buildings and structures in the rural electrification and communication system.

Handbook No. 4: Generalized indicators of values of waterworks.

In contrast to the generalized indicators for buildings and structures in the 1960 census, where generalized indicators were differentiated according to 10 territorial zones, the values of indicators in the collective farms census were differentiated for 20 zones. In the 20th zone, located behind the Arctic Circle, the replacement values of buildings and structures are 20 percent higher than in the adjacent zone to the south.

Similar to the 1960 census, the main attribute (characteristic quality) by which the buildings in the collective farms are classified is "kapital'nost," i.e., the totality of constructive elements built of specific material going into the structure of the building. Altogether, five such groups of buildings are discerned analogously to the 1960 inventory and revaluation. The handbooks do not provide values for all five groups of buildings. In order to facilitate the derivation of replacement values of similar buildings belonging to different groups of "kapital'nost," a table was compiled giving the adjustment coefficients for transfer from one group of "kapital'nost" to another. This table is reproduced below:

TABLE 5.—*Adjustment coefficients*

Group of "kapital'nost" according to handbooks	Adjustment coefficients for transfer to another group of "kapital'nost"				
	Group 1	Group 2	Group 3	Group 4	Group 5
1.....	1.00	0.93	0.86	0.80	0.74
2.....	1.08	1.00	.93	.86	.80
3.....	1.16	1.08	1.00	.93	.86
4.....	1.25	1.16	1.08	1.00	.93
5.....	1.35	1.25	1.16	1.08	1.00

Source: M. Freidlin, *Opređenje vosstanovitel'noi stoimosti zdani i sooruzhenii*, Vestnik Statistiki, No. 5, 1961, p. 66.

The handbooks furnish also corrections (adjustment coefficients) to the given values of generalized indicators which should be applied when some specified facilities or accommodations are lacking. So, for example, for a residential building belonging to the fifth group of "kapital'nost," the value of 1 m<sup>3</sup> of cubature is reduced by 8 percent for the lack of central heating, by 1.4 percent for the lack of water supply, by 2.8 percent for the lack of service facilities, by 0.4 percent for the lack of a radio, and by 0.5 percent for the lack of a telephone line.

## THE DETERMINATION OF THE DEGREE OF PHYSICAL WEAR AND TEAR

For measuring of wear and tear in the collective farms census, the same two methods were applied as in the 1960 census: physical inspection by experts, on one hand, and by comparing years of actual service with "normative" years of service life, on the other. The former method was preferred by the census organizers. "It is recommended," writes V. Gorelik (*Opredelenie Fizicheskogo iznosa osnovnykh fondov kolkhozov, Vestnik Statistiki, No. 6, 1961, p. 61*), "to determine wear and tear of machines and equipment by norms of service life only in cases when the collective farm has no possibility of being measured through an inspection of the technical state of the given equipment in kind." In the case of complicated machines and, especially, in technical inspection of buildings and structures, separate measurement of each component is recommended, and the degree of wear and tear of the whole object is derived as a weighted average of the sum of components. For this purpose the handbooks provide the specific weights of the inspected object. So, for example, the constructive elements of a typical residential building have the following weights:

	[In percent]	
Foundation.....		7
Walls and partitions.....		26
Floors.....		5
Roof.....		7
Floor coverage.....		9
Windows.....		8
Finish.....		10
Interior technical-sanitary and electrotechnical installations.....		21
Other works.....		7
<b>Total.....</b>		<b>100</b>

Source: *Vestnik Statistiki, No. 6, 1961, p. 57.*

In order to provide more objective frame of reference for the judgment of experts and technicians, it is recommended that use be made of auxiliary tables compiled for the 1960 census under the title: "Signs for the determination of percentage of wear and tear in components of buildings and elements of their accommodations." (See annex VIII.) This table specifies the typical symptoms of deterioration, corrosiveness, and other signs of wear and tear as objective criteria for the decision of experts.

For objects the direct technical inspection of which is not possible, a comparison is recommended between the actual and normative years of service. However, when the years of actual service are close to the normative ones, the probable additional years of service should be determined by expert decision, and the percentage share of wear and tear is derived by dividing actual years of service by actual plus additional years.

Among categories of livestock only draft animals are subject to the determination of wear and tear. This is measured by comparing the working period of a given animal with its predicted working age minus the price of the animal sold for slaughter at its retirement age. The following illustration explains the procedure. In order to determine the degree of wear and tear of a horse after 4 years of work and a 12-year average working age, we have first to find the price of

this horse when it will be sold for slaughter as a percentage of its actual, book value. The weight of the horse 300 kg., the procurement price of horsemeat slaughter weight equals 0.35 rubles per kg., the book value equals 250 rb. The retirement value of the horse as a percentage of the book value equals  $0.35 \cdot 300$

$$\frac{\quad}{250} \cdot 100 = 42 \text{ percent.}$$

250

From this we derive the percentage of wear and tear :

$$\frac{4}{12} \cdot (100 - 42) = 19 \text{ percent.}^{10}$$

#### AN APPRAISAL

From the point of view of scope, thoroughness of preparation, administration, number of participants, and extent of program, the Soviet general inventory and revaluation of fixed assets was an outstanding enterprise. The plenitude of data yielded by the censuses allows investigation of any aspect of the capital stock, such as volume, structure, age, serviceability, geographic distribution, or administrative attachment. The census also brought order and consistency, and to some extent simplification, into the current accounting on the book data on capital stock, and the results of the census will certainly contribute to more accurate methods of measuring Soviet capital and investment efficiency. However outstanding from an organizational point of view, the Soviet censuses of wealth raise some doubts insofar as the underlying basic methodological ideas are concerned.

The conceptual framework and methods applied—an outgrowth of a long list of partial and experimental censuses carried out in the past—show some peculiarities strictly connected with the overall character of the centrally planned and centrally operated Soviet economy.

The strong emphasis put on “physical,” technical problems in contrast to economic consideration, common in the bureaucratically administered Soviet economy, was reflected in the concepts applied in the censuses of wealth. This found its expression not only in the principle of price identity, equal replacement values for identical assets, but, what is more striking, the price variations for certain groups of equipment were strictly in proportion to the corresponding technical performances of revalued assets. Economically speaking, if a grain combine is one-third as productive as a combine of a modern type, this is not sufficient reason to assume that its price is also two-thirds lower.

It seems that the reliance of Soviet economists on physical, material, and technical aspects of fixed assets in the revaluation process is somewhere connected with the deficiencies of the overall system of Soviet price relatives, especially in the realm of means of production.

Connected with the physico-technical approach is the concept of “stereotype,” i.e., some typical machine or equipment the price and technical performance of which serves as a basis for measuring obsolescence of a similar but less advanced machine. The technical characteristics of a less advanced machine may be compared to a typical machine prevailing in the corresponding industry, or to the most modern and most efficient machine available. (In the latter case it may happen, that the overwhelming part of equipment installed in a given

<sup>10</sup> V. Gorelik: *Opređenje Fizicheskogo Iznosa osnovnykh fondov kolhozov*, Vestnik Statistiki, No. 6, 1961, p. 54.

industry is "obsolete.") As already mentioned, no definite answer can be found in Soviet literature as to how the stereotype is chosen. But whatever comparison scale is applied—the average technological level or the best available techniques—obsolescence cannot be treated as a pure byproduct of technological progress, it cannot be devoid of its economic content, cut off from its interrelations with capital-output and capital-labor ratios prevailing in specific branches of industry or sectors of the economy as well as in the economy as a whole.

The same overemphasis put on the physical aspects of inventoried fixed assets led the census takers to rely strongly on technical inspection for the determination of wear and tear, discarding basically the elaborate lists of "normative" service life already used for determination of depreciation rates. It is debatable whether impressions of experts and technicians were more substantial, objective, and accurate than the previously accepted norms of service life.

It is hard to avoid the impression that to some extent the strong reliance on physical and technical aspects of registered fixed assets defeated the objectives of the censuses. By excluding land and natural resources from the census, the census takers discarded also the problem of rent and quasi-rent. But in order to assess accurately and compare the degrees of utilization of available capital stock in, for example, some State or collective farms, the rent due to location or fertility cannot be ignored.

In the years 1963 and 1964 the Soviet authorities are planning a far-reaching comprehensive revision of the entire price system established July 1, 1955. A considerable increase is foreseen in the prices of basic materials (coal, ores, electricity, etc.). Such increases will influence also the prices of machinery and equipment. It is commonly accepted by Soviet economists that in the overall structure of price relatives, prices of machinery are "underestimated." Nevertheless, in spite of the deficiencies of the existing price structure, Soviet authorities decided to carry out the general revaluation of fixed assets in 1955 prices. The awareness that the price relatives will be revised in the near future induced the census takers to equate price differentials with differences in technical characteristics or performances.

It is worth noting that a comparison of replacement values yielded by the 1960 revaluation with the original values of Soviet fixed assets shows that while the replacement values for buildings and structures (including transmissions) are correspondingly 22 and 27 percent higher than the original values, the opposite is true for machinery and equipment (the replacement value for power equipment is 9 percent; that of productive machines, 10 percent; and for means of transportation, 8 percent, lower than the original values. (See A. Beliakov, *Nekotorye itogi pereotsenki osnovnykh fondov S.S.S.R.*, *Vestnik Statistiki*, No. 10, 1960, p. 6) This is explainable by differences in price movements of groups of fixed assets in the two decades preceding the 1960 census. The larger part of buildings and structures was built in the prewar period when prices and wages were considerably lower than the postwar prices and obsolescence of relatively old machines apparently did not offset the difference in price level. The pending Soviet price reform will certainly cause some changes in the structure of Soviet fixed assets, which will hinder the extrapolation of data obtained through 1960 and 1962 capital stock censuses.



II. Distribution of fixed funds indicated in section I into productive funds of main activity and funds in other than main activity :

A. Productive funds of main activity :

Buildings	-----	-----
Structures and transmissions	-----	-----
Power equipment	-----	-----
Of which automatic	-----	-----
Operating equipment	-----	-----
Of which automatic	-----	-----
Measurement and control devices	-----	-----
Laboratory equipment	-----	-----
Of which automatic	-----	-----
Means of transportation	-----	-----
Tools	-----	-----
Implements, productive and household	-----	-----
Livestock, draft and productive, poultry, apiaries	-----	-----
Of which draft animals	-----	-----
Perennial plantings	-----	-----
Land amelioration and ponds (except structures)	-----	-----
Other fixed funds	-----	-----

Total in group A -----

B. Fixed funds in other than main activity -----

Total in group B -----

Grand total for section II (A plus B) -----

*Column headings*

Original, book value of fixed funds on Jan. 1, 1960, before revaluation (thousand rubles)	Replacement value of fixed funds after revaluation, on Jan. 1, 1960 (thousand rubles)	Results of revaluation in money terms (thousand rubles)		Actual wear and tear of fixed funds determined during revaluation	
		Markup (plus)	Markdown (minus)	In money terms (thousand rubles)	In percentage of replacement value
(1)	(2)	(3)	(4)	(5)	(6)
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----

III. Distribution of fixed funds indicated in section I according to sectors of the economy:

Sectors:

Industry	-----	-----
Construction	-----	-----
Agriculture	-----	-----
Forestry	-----	-----
Transportation	-----	-----
Communication	-----	-----
Procurements	-----	-----
Material—technical supplies and sales	-----	-----
Trade and public catering	-----	-----
Housing	-----	-----
Municipal economy and services	-----	-----
Public health, physical education, social insurance	-----	-----
Education	-----	-----
Science	-----	-----
Art	-----	-----
Other sectors of the economy	-----	-----

Total -----

Reference:

Replacement value of fixed funds disclosed during revaluation	-----	-----
Value of funds not available according to the balance	-----	-----
Value of wear and tear according to the balance on Jan. 1, 1960	-----	-----
Actual expenses on capital repairs (complete and unfinished) for the year 1959	-----	-----

(Column headings the same as in part II)

-----  
 Manager of the enterprise (signature)

-----  
 Chief bookkeeper (signature)

ANNEX II

Central Statistical Administration attached to the Council of Ministers  
 of the U.S.S.R.

REPORT ON THE RESULTS OF REVALUATION AND DETERMINATION OF WEAR AND TEAR OF BUILDINGS FOR PRODUCTIVE, CULTURAL, TRADE, AND OTHER USES (EXCEPT RESIDENTIAL HOUSING)

1. Name of enterprise, organization (economy)-----
2. Ministry, department, economic regional council, executive committee of the krai, oblast', city or rayon of the Soviet of Deputies of working people, or cooperative organization to which the registered enterprises is attached-----
3. Sector of the economy-----
4. Branch of industry-----
5. Kind of production-----
6. Address of enterprise, organization: Republic-----  
 oblast' (krai) -----, city -----, rayon -----





ANNEX III

Form No. 3

Central Statistical Administration attached to the Council of Ministers of  
the U.S.S.R.

REPORT ON THE RESULTS OF REVALUATION AND DETERMINATION OF WEAR AND  
TEAR OF RESIDENTIAL BUILDINGS

1. Name of enterprise, organization (economy) -----
2. Ministry, department, economic regional council, executive committee of the  
krai, oblast', city or rayon of the Soviet of Deputies of working people, or  
cooperative organization to which the registered enterprise is attached -----
3. Sector of the economy -----
4. Branch of industry -----
5. Kind of production -----
6. Address of enterprise organization: Republic -----  
oblast' (krai) -----, city -----, rayon -----



ANNEX IV

Form No. 4

Central Statistical Administration attached to the Council of Ministers of the U.S.S.R.

REPORT ON THE RESULTS OF REVALUATION AND DETERMINATION OF WEAR AND TEAR OF STRUCTURES AND TRANSMISSIONS

1. Name of enterprise, organization (economy) -----
2. Ministry, department, economic regional council, executive committee of the krai, oblast', city or rayon of the Soviet of Deputies of working people, or cooperative organization to which the registered enterprise is attached -----
3. Sector of the economy -----
4. Branch of industry -----
5. Kind of production -----
6. Address of enterprise, organization: Republic -----  
oblast' (krai) -----, city -----, rayon -----

Column headings

Denomination of types of structures and transmissions	Unit of measurement	Quantity of units	Original value of structures and transmissions before revaluation according to the book value on Jan. 1, 1960 (thousand rubles)	Replacement value of structures and transmissions after revaluation on Jan. 1, 1960 (thousand rubles)	Results of revaluation in money terms (thousand rubles)		Actual wear and tear of structures and transmissions determined during revaluation	
					Markup (plus)	Mark-down (minus)	In money terms (thousand rubles)	In percent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----

ANNEX V

Form No. 5

Central Statistical Administration attached to the Council of Ministers of the U.S.S.R.

REPORT ON THE RESULTS OF REVALUATION AND DETERMINATION OF WEAR AND TEAR OF EQUIPMENT

1. Name of enterprise, organization (economy) -----
2. Ministry, department, economic regional council, executive committee of the krai, oblast', city or rayon of the Soviet of Deputies of working people, or cooperative organization to which the registered enterprise is attached -----
3. Sector of the economy -----
4. Branch of industry -----
5. Kind of production -----
6. Address of the enterprise, organization: Republic -----  
oblast' (krai) -----, city -----, rayon -----



## ANNEX VII

## SOVIET INDUSTRIAL CLASSIFICATION

- I. Ferrous metallurgy:
  1. Extraction of ferrous ores.
  2. Production of pig iron, steel, and rolled products.
  3. Production of electric ferroalloys.
  4. Secondary processing of ferrous metals.
  5. Production of metallurgical coke.
  6. Output of fireproof material.
  7. Extraction of nonmetallic raw material for the ferrous metallurgical industry.
  8. Output of metal products for industrial uses.
- II. Nonferrous metallurgy:
  1. Extraction of nonferrous ores.
  2. Nonferrous metallurgy.
- III. Fuel industry and output of products from coal, oil, and shales:
  1. Coal Industry:
    - (a) Coal extraction.
    - (b) Coal enrichment.
    - (c) Output of coal briquettes.
  2. Crude oil extraction.
  3. Oil products.
  4. Gas industry:
    - (a) Extraction of natural gas.
    - (b) Output of artificial gas.
    - (c) Underground coal gasification.
    - (d) Petrol production from gas.
  5. Peat industry:
    - (a) Peat extraction.
    - (b) Output of peat briquettes.
  6. Oil shales industry.
  7. Other branches of the fuel industry.
- IV. Output of electrical and heat energy:
  1. Power stations.
  2. Electrical and thermal nets.
  3. Detached boilerships.
- V. Machine-building and metal products:
  - A. Machine building:
    1. Energy-generating machine building.
    2. Electrotechnical machines:
      - (a) Output of electrotechnical equipment for industrial use.
      - (b) Production of cables.
      - (c) Output of electrical appliances for personal use.
    3. Radiotechnical industry:
      - (a) Output of radio equipment for industrial use.
      - (b) Output of radio equipment for personal use.
    4. Machine tools and instruments:
      - (a) Metal-cutting and wood-processing machine tools.
      - (b) Pressing and forging equipment.
      - (c) Casting and founding equipment.
      - (d) Output of instruments.
    5. Output of implements:
      - (a) Production of calculating machines.
      - (b) Production of other implements for industrial use.
      - (c) Production of implements for personal use.
    6. Production of boring equipment and equipment for metallurgy; ore, oil, and gas extraction; oil processing; and the peat industry.
    7. Production of pumps, compressors, refrigeration equipment and equipment for the chemical industry.
    8. Output of equipment for timber and paper industry.
    9. Output of machinery and equipment for the light industry.
    10. Output of equipment for the food industry.
    11. Output of equipment for the printing industry.
    12. Output of lifting and transporting machinery.

## SOVIET INDUSTRIAL CLASSIFICATION—Continued

## V. Machine-building and metal products—Continued

## A. Machine building—Continued

13. Roadbuilding machinery and output of equipment for the industry of building materials:
  - (a) Output of equipment for construction and roadbuilding.
  - (b) Output of equipment for the industry of building materials.
14. Output of means of transportation, except the automobile industry:
  - (a) Equipment for railroad transportation.
  - (b) Shipbuilding.
  - (c) Production of trolley buses.
  - (d) Carts and sledge production.
15. The automobile industry.
16. Output of tractors and agricultural machinery:
  - (a) Output of tractors.
  - (b) Output of agricultural machines.
17. Production of roll bearings.
18. Production of medical equipment, instruments, and apparatuses.
19. Other branches of the machine-building industry:
  - (a) For industrial uses.
  - (b) For nonindustrial uses.

## B. Output of metal products:

1. Output of sanitary-technical equipment.
2. Output of other metal products for industrial uses.
3. Output of metal products for mass consumption.

## C. Output of metal constructions.

## D. Output of repair shops:

1. Special repair shops for metal-cutting machine tools and forging and pressing equipment.
2. Special repair shops for industrial and building equipment.
3. Special repair shops for railroad rolling stock and means of communication.
4. Repair of ships.
5. Repair of trucks.
6. Repair of passenger cars.
7. Repair of tractors and agricultural machines.
8. Repair of tramways, subway cars, and trolley buses.
9. Repair of equipment and metal products of mass consumption.

## VI. Output of abrasive products, and products of mica and graphite:

1. Production of abrasive products.
2. Output of mica and graphite products.

## VII. Chemical industry:

1. Extraction of chemical raw materials (excluding salt extraction):
  - (a) Extraction of phosphates, apatites and potassium salts.
  - (b) Extraction of other chemical raw materials.
2. Heavy chemistry.
3. Production of aniline dyes.
4. Production of plastics.
5. Production of artificial fibers.
6. Production of synthetic rubber.
7. Production of organic synthetic and other chemical products.
8. Photochemical supplies.
9. Production of paints and varnishes.
10. Production of pharmaceutical products.
11. Chemical wood processing and wood hydrolysis:
  - (a) Chemical wood processing.
  - (b) Wood hydrolysis.

SOVIET INDUSTRIAL CLASSIFICATION—Continued

VII. Chemical industry—Continued

12. Production of tanning materials.
13. Rubber and asbestos products:
  - (a) Output of rubber products (except rubber footwear and other rubber consumer goods).
  - (b) Output of automobile tires.
  - (c) Output of rubber footwear.
  - (d) Output of rubber toys and other products of mass consumption.
  - (e) Output of asbestos products.

VIII. Timber-cutting, paper- and wood-processing industry:

1. Timber cutting.
2. Wood products (including the match industry):
  - (a) Wood-sawing industry.
  - (b) Plywood industry.
  - (c) Production of prefabricated houses.
  - (d) Output of wood products for the building industry.
  - (e) Production of wooden tare.
  - (f) Output of other wood products for industrial uses.
  - (g) Production of furniture; production of new furniture.
  - (h) Furniture repairs and restorations.
  - (i) Output of wooden kitchen utensils and other products of mass consumption.
  - (j) Match industry.
3. Paper industry.

IX. Building materials industry:

1. Cement industry.
2. Output of lime, gypsum, and allied products.
3. Output of materials for walls and tiles:
  - (a) Output of bricks and tiles.
  - (b) Output of wall blocks.
4. Output of concrete and reinforced concrete constructions and details.
5. Output of gypsum products for the building industry.
6. Production of asbestos-cement products and of slate.
7. Production of roofing materials.
8. Output of building ceramics.
9. Output of insulating products.
10. Output of linoleum and allied products.
11. Output of ceramical acidproof products.
12. Output of nonmetallic building materials and of light filling materials.
13. Other branches of the building material industry, nonspecified otherwise.

X. Glass, china, and faience industry:

1. Glass industry:
  - (a) Output of glass for building and technical uses.
  - (b) Output of glass products for medical and chemicolaboratory uses.
  - (c) Output of electrotechnical and electrovacuum glass products.
  - (d) Output of glass tare.
  - (e) Output of glass fiber.
  - (f) Output of houseware glass.
2. China and faience industry:
  - (a) China and faience products for construction and technical use.
  - (b) China products for medical uses.
  - (c) Houseware china.
  - (d) Houseware ceramic products.



## SOVIET INDUSTRIAL CLASSIFICATION—Continued

## XI. Light industry:

## 1. Textile industry:

- (a) Cotton-ginning industry.
- (b) Primary processing of flax.
- (c) Primary processing of other bast fiber.
- (d) Pool-washing industry.
- (e) Silk-reeling industry.
- (f) Cotton goods industry:
  - Production of cotton fabrics except specialized factories of technical goods.
  - Production of cotton technical goods.
  - Detached cotton-spinning, spinning and looming, and looming plants.
- (g) Output of linen industry:
  - Output of linen fabrics except specialized factories of technical linen goods.
  - Output of linen technical and packing material.
  - Detached flax-scratching and flax-loomng factories.
- (h) Wool industry:
  - Output of wool fabrics except specialized factories of woollen technical goods.
  - Output of woollen technical fabrics and products.
  - Detached spinning, spinning and looming, and loomng factories of woollen goods.
- (i) Silk industry:
  - Output of silk fabrics.
  - Detached silk-reeling, silk-spinning, and silk-loomng factories.
- (j) Hemp and jute products.
- (k) Production of fishing nets.
- (l) Production of textile dry goods.
- (m) Output of knitted goods:
  - Production of knitted goods.
  - Repairs of knitted goods.
- (n) Production of artificial fur.
- (o) Felt and felt products.

## 2. Sewing industry:

- Production of garments.
- Repairs of garments.

## 3. Leather, fur, and shoe industry:

- (a) Output of leather.
- (b) Output of artificial leather.
- (c) Harness industry.
- (d) Output of travel accessories and other leather products.
- (e) Fur industry.
- (f) Shoe industry:
  - New shoe production.
  - Repairs of shoes.

- (g) Bristle products and the brush industry.

## 4. Other branches of the light industry.

## SOVIET INDUSTRIAL CLASSIFICATION—Continued

## XII. The food industry:

1. Fish industry:
  - (a) Fish industry except fish conserves.
  - (b) Fish canned food.
2. Meat industry:
  - (a) Meat products except meat conserves.
  - (b) Output of meat conserves.
3. Butter, cheese, and milk products:
  - (a) Butter, cheese, and milk products except canned milk.
  - (b) Output of canned milk.
4. Sugar industry.
5. Flour and groats industry:
  - (a) Flour milling.
  - (b) Groats production.
6. Output of bakeries.
7. Output of confectioneries.
8. Output of the macaroni industry.
9. Vegetable oil and fat industry.
10. Fruit and vegetable products:
  - (a) Fruit and vegetable products, except preserves.
  - (b) Output of fruit and vegetable preserves.
11. Alcohol industry.
12. Liqueur and vodka industry.
13. Wine production.
14. Beer production.
15. Yeast production.
16. Output of soft beverages.
17. Starch and molasses industry.
18. Tea industry:
  - (a) Primary tea processing.
  - (b) Tea packing industry.
19. Salt industry.
20. Tobacco and makhorka industry:
  - (a) Primary processing of tobacco.
  - (b) Production of tobacco and makhorka products.
21. Products of perfumery and cosmetics.
22. Other branches of the food industry.

## XIII. Other branches of industry:

1. Extraction of nonmetallic ores.
2. Output of objects for cultural use:
  - (a) Printed matters.
  - (b) Film products.
  - (c) Output of musical instruments.
  - (d) Office accessories and visual aids.
  - (e) Objects d'art and jewelries.
  - (f) Toy production.
3. Water supplies.
4. Fodder production.
5. Button production.
6. Other branches of industry, not specified otherwise.

## ANNEX VIII

SIGNS (INDICATIONS) FOR THE DETERMINATION OF PERCENTAGE OF WEAR AND TEAR  
IN COMPONENTS OF BUILDINGS AND ELEMENTS OF THEIR ACCOMMODATIONS

*Foundations, brick walls, roofs, partitions, windows, sidewalks, heating systems, sewage works, etc.*

State of component or element	Range of percent of wear and tear	Signs, symptoms, indications
Good.....	0-10	Description of signs (symptoms) corresponding to each state of wear and tear.
Better than satisfactory.....	11-20	
Satisfactory.....	21-30	
Less than satisfactory.....	31-40	
Unsatisfactory.....	41-60	
Dilapidated.....	61-80	
Unfit for habitation.....	81-100	

NOTE.—Annexes I and VI and VIII were translated from P. Bunich, *Pereotsenka osnovnykh fondov*, Gospolitizdat, 1959; annex VII translated from V. Ostroumov, V. Gorelik, *Organizatsia raboty po pereotsenke osnovnykh fondov*, Gosfinizdat, 1959.

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APPENDIX I: PART E  
WEALTH SURVEYS IN JAPAN  
By YATAKA SHIMIZU  
Statistical Office of the United Nations

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# WEALTH SURVEYS IN JAPAN

## I. INTRODUCTION

### A. BRIEF DESCRIPTION OF JAPANESE NATIONAL WEALTH ESTIMATES PRECEDING THE 1955 NATIONAL WEALTH SURVEY

In Japan, national wealth estimates have been made by certain Japanese scholars and foreign economists since 1841.<sup>1</sup> Most of these were very rough estimates based upon scattered data.

The first systematic study was the 1905 national wealth survey which was conducted by the Bank of Japan. Since then, a series of national wealth surveys has been conducted by the Bank of Japan (1910 and 1917), the Census Bureau (1913 and 1919), and by the Statistics Bureau of the Prime Minister's Office (1924, 1930, and 1935).

The main purposes<sup>2</sup> of these national wealth surveys were—

1. To make possible international comparison of national resources.
2. To measure national economic growth by indicating the difference between a country's accumulated assets at different periods in time.
3. To measure the capital coefficient, by showing the relation between national wealth and national income.
4. To show the structure and distribution pattern of national resources.

Thus, the coverage of assets in the national wealth estimates was very wide. Assets included in these estimates were land, natural resources of virgin forests, subsoil resources, producers' goods, household goods, gold, antiques, books kept in libraries, paintings and other collections held by museums, and net foreign assets and liabilities. It should be noted that national wealth estimates prior to 1930 had been based only on existing data, but from 1930 the estimates were made on the basis of existing data supplemented by inquiries or field surveys.

One other point which had to be remembered is that, in the case of the 1930 and 1935 national wealth surveys, a national income survey was also conducted at the same time<sup>3</sup> by using the production approach. In these surveys, the concept of national wealth was not clearly defined, the coverage of wealth was the same as in previous years, and the techniques and data utilized for the national income estimates were rather primitive.<sup>4</sup> But a highly useful effort was

<sup>1</sup> "Modern Statistics Dictionary," compiled by Ichiro Nakayama; the Tokyo Keizai Press, October 1962.

<sup>2</sup> "National Income Accounts 1957 and National Wealth Survey 1955," Economic Planning Agency.

<sup>3</sup> "National Wealth and National Income Survey, 1935," Bureau of Statistics, Prime Minister's Office.

<sup>4</sup> Net income was estimated with the following industrial breakdown: Agriculture, fishing, mining, manufacturing, commerce, transportation, public and private and domestic services, and net foreign investment and net foreign transactions. That is, all intermediary expenses were subtracted from the total production values of each industry.

made to clarify the relationship between national wealth and national income.

Because of World War II, a national wealth survey was not conducted again until 1955. The only estimate which gives national wealth figures for 1945 is "A Survey on Losses and Damages During the War"<sup>5</sup> carried out by the Economic Stabilization Board (now Economic Planning Agency) in 1947.

#### B. OUTLINE OF 1955 NATIONAL WEALTH SURVEY

The 1955 national wealth survey was carried out by the Economic Planning Agency in accordance with a resolution of the Cabinet Council on June 7, 1955. The preparation of this survey was begun in 1953 and the results were published in 1957.

The Economic Council Board (now Economic Planning Agency) established a National Wealth Survey Preparation Unit in 1953. This unit started at once the collection of necessary data, the analysis of existing data, and the study of methodology for carrying out the survey.

An advisory group of the national wealth survey was also established by the same board in the same year and the group discussed the problems presented by the Preparation Unit. In accordance with the establishment of the National Wealth Surveying Committee by the resolution mentioned above, the advisory group was amalgamated with the new committee.

The 1955 national wealth survey consisted of 4 designated surveys based on the statistics law and 10 test and rechecking surveys based upon the statistics report control law. The area covered was the whole Japanese territory as of December 31, 1955.

In the case of roads, bridges, canals, and harbor establishments, for which a field survey would have been very difficult, estimates were made insofar as the existing data would permit.

Field surveys were made on an ownership rather than on a user basis. The cities, towns, and villages covered by the survey were 2,654 in total, and the number of supervisors and enumerators were 800 and 7,952, respectively.

Tabulation was made by the Statistics Bureau, Office of the Prime Minister; the total manpower used for tabulation was almost 140,000 men. The total expense for this survey was 134.4 million yen.

#### C. OUTLINE OF 1960 NATIONAL WEALTH SURVEY

The main purposes of the 1960 survey were "estimating the value of national wealth at the end of 1960, to make clear the structural change of wealth and the level of investment and, at the same time, to trace the yearly investment amount since 1955."<sup>6</sup>

Thus, with the exception of the household sector, the concept, definition, coverage of assets, and the sectors covered were the same as those employed in the 1955 survey. In the case of the household

<sup>5</sup> This survey was carried out with the cooperation of various Government agencies on the basis of administrative data collected during the war.

<sup>6</sup> "The Basic Plan of 1960 National Wealth Survey," Economic Planning Agency, October 1960.

sector, only the value of buildings was to be estimated on the basis of existing data.

The Economic Planning Agency again was the responsible agency. The results were expected to be published during 1963. Another full survey was planned for 1965.

## II. 1955 NATIONAL WEALTH SURVEY

### A. PREPARATION OF SURVEY

#### 1. *Establishment of National Wealth Survey Committee*

The National Wealth Survey Committee comprised 24 members under the chairmanship of Ichior Nakayama, professor of Hitotsubashi University. The members included government officers, professors, and civilians who had deep knowledge and experience on economic social accounts, accountancy, and management of assets.

Nine meetings were held in all, with discussions concerning concept, definition, inclusion of assets, method of valuation, sampling systems, etc. The various opinions prevailing among the members of the committee might be summarized as follows:

(a) The main focus of the 1955 national wealth survey should be placed on obtaining data which would suffice to make clear the relation between national income and national wealth and to provide a foundation for the establishment of economic policies or plans. Thus, very wide but rather vague objectives adopted in the former national wealth surveys would be amended.

(b) The assets included would be confined to those assets which had been produced through economic activities and had been stocked by the residents of Japan. The assets included in national wealth would be selected on the basis of the definitions employed in "A System of National Accounts and Supporting Tables."<sup>7</sup>

(c) Valuation of assets should be made through an objective method rather than a subjective method of employing the reported value of respondents.<sup>8</sup> Adjusted replacement cost prices are preferable to original cost prices.

(d) The results should be published in such a way as to make clear the distribution of assets by economic sectors. The economic sectors would be at least as many as those recommended by the United Nations in the publication mentioned above.

(e) Industrial classification should be in as much detail as the cost allocated for the survey would permit.

(f) In the present situation, to carry out surveys on an owners' basis rather than on a users' basis is necessary.

(g) The "Returns to the Tax Administration Agency,"<sup>9</sup> prepared by corporations on the basis of the assets revaluation law or the assets substantiality law would be utilized to avoid unnecessary burden of respondents.

<sup>7</sup> "A System of National Accounts and Supporting Tables, Studies in Methods," ST/STAT/SERF/No. 2, September 1953, United Nations.

<sup>8</sup> As in the national wealth survey of 1953; in the former surveys, the values of assets reported by respondents were summed up.

<sup>9</sup> In the returns, kinds or use of assets, time of acquisition, value of assets at the time of acquisition, lifetime, etc., are shown for each asset.

(h) Uniformity in the classification of assets as well as in the valuation of assets would be maintained throughout the entire survey.

(i) Consumers' durable goods held by households would also be surveyed for the special purpose of checking rehabilitation of the household sector. In the statistical tables, consumers' durable goods would be shown separately, in consideration of the relation between national wealth and national income.

## 2. *Concept of national wealth*

The concept of national wealth employed in this survey is a national aggregate of stocks of reproducible tangible fixed assets, inventory, and the net balance of assets and liabilities owned by the residents in the Japanese territory at December 31, 1955.

(a) *Assets covered in the survey.*—Based upon the recommendation given by the National Wealth Surveying Committee, the national wealth was defined to include all goods produced and stocked for use in future productive process. Assets included were machinery, equipment, plants, buildings, construction and works, and producers' stock or raw materials, semifinished and finished goods, and the net of international assets and liabilities.

Because of the confused situation of international assets and liabilities at the surveying date, only the assets and liabilities which had been confirmed by the Japanese Government were included.

Certain intangible assets such as patents, concessions, and goodwill were omitted both because of the difficulty of valuation and because there was no clear-cut relationship between such values and their contribution to future production of the nation as a whole.

Some other assets excluded because of the difficulty of valuation were natural resources, land, books, and art objects except those held as stocks.

Nondurable goods held as other than business inventories were also excluded under an assumption that these goods had already been consumed.

(b) *Meaning of Japanese territory.*—Japanese territory includes all territories over which the Japanese Government held sovereignty at the end of 1955. These were Honshu, Shikoku, Kyushu, and Hokkaido and the thousands of small islands scattered around these four major islands.

(c) *Definition of residents.*—Residents include not only individual citizens of Japan, but also all institutions such as central government, government enterprises, local authorities, public corporations, non-profit institutions, unincorporated enterprises, partnerships, and households. The concept of normal resident adopted by the International Monetary Fund was utilized in its entirety.

## 3. *Degree of detail as to type and characteristics of capital goods*

(a) *Two problems concerning the character of capital goods.*—The concept and definition of national wealth and of capital goods included were mentioned in the former chapter. The types of assets were also specified in the same place. Capital goods included in the survey were, as a rule, all durable goods with an expected life time of more



than 1 year. This rule has been kept as much as possible through all surveys carried out for the estimation of national wealth.

But, it should be confessed that the treatment of capital goods—especially small items such as hand tools, tires, office desk equipment, etc.—was widely different as between private and public corporations or even as between big private corporations and small private corporations or unincorporated enterprises.

In most cases, especially in big corporations, small goods which cost less than 50,000 yen were charged to current expense, irrespective of their lifetime. In some factories, hand tools, etc., lent out from the custodian room were considered as “consumed” in the account books, and only the names of borrowers were registered. Even in these cases, an effort to list these tools in questionnaires was made through the efforts of enumerators and the rechecking survey held after the main national wealth surveys.

Similar problems had arisen regarding the treatment of repair and maintenance. Excluding very big repairs, most repairs were also treated usually as current expenses in most enterprises. In principle, expenditure on repairs and maintenances which prolong the lifetime of the capital goods was considered just the same as original investment on the repaired assets themselves. Every respondent was asked to fill in the questionnaire the same way as in the case of fixed capital goods. That is, the type and kind of assets for which repair was made, the date of investment, amount invested, etc. (see form of questionnaire used) were entered in the questionnaire case by case.

According to the date of acquisition, the type and kind of assets for which repairs were made, the use of the assets, the remaining lifetime, and a price index were determined to compute adjusted replacement cost prices. The replacement cost prices thus obtained were added to the adjusted replacement cost prices of the original (i.e., before repair) assets.

The omission of these investments was also checked in the rechecking survey. But the fruits obtained from the rechecking survey were much less than the fruits obtained from the rechecking of small equipment. The main reason for this was the difficulty of catching (by inspection) the place repaired, the degree of repairs and the time of repairs, and the difficulty of finding records about these investments.

(b) *Degree of detail as to type of capital goods.*—Two publications were prepared with the collaboration of the Bureau of Statistics for use in tabulation and as a guide for supervisors. These were “Classification Rules for Assets” and “Life Time Table for Tangible Fixed Assets by Type of Assets and by Industrial Use.”

(1) *Classification Rules for Assets:* The publication utilized for the compilation of this book is the “Life Time Table of Fixed Assets” prepared by the Ministry of Finance Ordinance. In the case of electricity and local railways and tramways, the classification of assets differs from that in other industries; the classification rules for these industries was set forth in “Account Rule for Electricity” and “Account

Rule for Local Railways and Tramways." All assets were classified as follows:

A. Buildings

- A01 Dwellings  
 A011 Ferro-concrete  
 A012 Steel-frame  
 A013 Brick  
 A014 Stone  
 A015 Brick  
 A016 Wood

- A02 Nonresidential buildings  
 A021 Ferro-concrete  
 A022 Steel-frame  
 A023 Brick  
 A024 Stone  
 A025 Brick  
 A026 Wood

- A03 Building equipment

B. Construction

- B10 Construction for traffic facilities  
 B100 Railroad and tramways  
 B101 Road paved  
 B102 Made of ferro-concrete  
 B103 Made of concrete  
 B104 Made of brick  
 B105 Made of stone  
 B106 Made of clay  
 B107 Made of metals  
 B108 Made of other materials than specified  
 B109 Made of wood

- B11 Construction for water facilities  
 B111 Made of ferro-concrete  
 B112 Made of concrete  
 B113 Made of brick  
 B114 Made of stone  
 B115 Made of clay  
 B116 Made of metals  
 B117 Made of other materials than specified

- B19 Other construction  
 B191 Made of ferro-concrete  
 B192 Made of concrete  
 B193 Made of brick  
 B194 Made of stone  
 B195 Made of clay  
 B196 Made of metals  
 B197 Made of other materials than specified  
 B198 Made of wood

C. Machinery and equipment

- C20 Power-generating machinery  
 C21 Boiler  
 C22 Machine tools  
 C23 Movable equipment (crane, etc.)  
 C29 Others

D. Ships

- D30 Made of steel  
 D31 Made of wood  
 D39 Made of other materials

E. Transportation equipment

- E40 Railway vehicles  
 E41 Aircraft  
 E42 Motor cars  
 E43 Other

- F. Tools and implements
- G. Land (Land itself was not surveyed)
  - G50 Residential lots
  - G51 Agricultural land
  - G52 Forest and woods
  - G59 Other lands
- H. Suspense account for construction
- I. Animals and plants
  - 1a Animals
  - 1b Plants
- J. Household furniture
  - J60 Furnitures and fixtures
  - J61 Clothes
  - J69 Others
- X Other goods not elsewhere classified
- Y. Inventory
  - Y90 Raw materials
  - Y91 Semimanufactured goods
  - Y92 Manufactured goods
  - Y93 Other

The code number fixed to the name of each asset is the same number which had been utilized for the tabulation. The definition and the name of assets included in each group mentioned above are given in detail. The main objective of this book, was to make it easy to specify where an asset had to be classified. Supervisors of the national wealth survey and heads of tabulation units in the Statistical Bureau were fully trained to solve problems which might occur in the course of execution of surveys and of tabulation.

The sectors consisted of the following groups :

	<i>Public</i>	<i>Private</i>
Central government	Nonenterprise	Communities
	Enterprise	Corporations
	Public assets	Profit
	Public corporations	Nonprofit
Local government		Noncorporate businesses
	Nonenterprise	Profit
	Enterprise	Nonprofit
		Households

(2) Lifetime Table for Tangible Fixed Assets, by Type of Assets and by Industrial Use: Industrial classification employed in this book was based upon the standard industrial classification for Japan. The lifetime used was physical lifetime rather than the combined lifetime of assets weighted by both physical and invested value of each asset composing a set. Further comments about the lifetime will be made in the next chapter.

Almost 12,000 items were listed in this book. The names of assets were classified and arranged in the order of buildings, construction, machinery and equipment, ships, transportation equipment, and tools and implements.

Buildings, construction, and transportation equipment were classified on the basis of structure of asset and of use. As the lifetime of machinery and equipment differs by industry, machinery and equipment were listed in the Japanese alphabetical order within each major group of manufacturing industry.

This book was utilized mainly for editing and tabulating.

#### 4. Method of valuation<sup>10</sup>

Not only is national wealth composed of assets of various kinds, but the quantities and time of procurement are different even for assets of the same kind. Their prices are accordingly different. In other words, national wealth is a heterogeneous collection of assets purchased at various times and prices. Thus, a simple addition of the prices of various assets would be meaningless. To obtain a duly evaluated figure for national wealth, a uniform and common standard is necessary.

Although there are various methods of evaluating assets, the present survey adopted adjusted replacement cost as the most suitable standard for its purpose.

Assets were valued at an adjusted cost of replacement price at the end of 1955. This price is the difference between the outlay necessary for replacement of the assets by a similar asset through manufacture or purchase and a figure representing the value of that part of the asset which was consumed. To calculate adjusted cost of replacement prices, investigations for individual assets were made.

(a) *Valuation method for tangible fixed assets.*—In general, replacement cost prices for tangible assets were estimated by the following method:

(1) *Commodity price ratio:* The commodity price ratio used in the calculation of replacement cost prices was especially prepared by the Economic Planning Agency for use in its 1955 national wealth survey. This ratio was calculated according to the classification, structure, or use of the assets, and expenses; the ratio of 1955 prices to prices in each year during the period from 1871 to 1955.

(2) *Depreciation:* To determine the amount to be deducted from assets prices due to use of the assets surveyed, the following methods were used:

i. *Estimation of depreciation by the fixed-ratio method.*

For ordinary assets, depreciation was estimated on the basis of durability. The durability figure used was based on the durability of individual assets as prescribed in a Ministry of Finance ordinance. The remaining life of the asset in years was converted to value terms by subtracting the amount of depreciation as determined by the fixed-ratio method. In the case of assets whose life had already expired, deduction for depreciation was not ended at 10 percent of the assets' original cost. To facilitate its calculations, the Economic Planning Agency prepared its own balance ratio table for durability from 2 to 100 years.

ii. *Estimation of depreciation by the proportion-of-production method.*

For assets used in mining such as mineshafts, the amount of past depreciation allowed (based on the original cost, and using the proportion-of-production method) was subtracted from the original cost of the assets. The result was then multiplied by the price ratio prepared by the agency.

<sup>10</sup> This section on valuation and the following section B on the actual conduct of the survey were taken from Economic Bulletin No. 1, February 1959, Economic Research Institute, Economic Planning Agency, Government of Japan. Mr. Shimizu wrote a much more extensive account of these matters, which was of great help as a background for ch. 3, but could not be reproduced here due to space limitations. (J.W.K.)

iii. Determination of the depreciation ratio for replaceable assets.

For such assets as rail and electricity transmission facilities, and roads, which are more properly handled as replaceable assets, the balance ratio was valued at one-half the total value, irrespective of durability.

(3) Depreciation due to obsolescence or damage: For assets which were becoming obsolete due to advances in production technique and assets damaged by natural disasters, estimation of replacement price by the methods explained above is inadequate. In such cases, the nature of the obsolescence or damage was investigated and the amount of depreciation to be deducted for those reasons was determined for consideration in estimating replacement price.

(b) *Method of valuing inventory assets.*—In general, inventory assets were valued at standard or replacement cost prices as a result of inventories taken at the time of the survey. However, in the event that inventory was not taken at the time of the survey, as was the case for large enterprises, the results of the most recent inventory on the company's ledger were used. Because most inventory assets, unlike tangible assets, were produced near the time of the survey, the rotation rate is apparently high and prices in 1955 were fairly steady. Book inventory prices were regarded as the equivalent of replacement cost prices at the time of the survey.

#### B. EXPLANATORY NOTES ON THE CONDUCT OF THE SURVEY

##### 1. *Government and government-affiliated organizations' property survey*

The survey of the Government and its affiliated organizations was conducted by the Ministry of Finance or the organization concerned.

*Coverage.*—All the property of the Government and the property possessed by the Government monopoly, the Telegraph Corp., and the Japan Railway Corp.

*Other.*—The figures submitted were adjusted for appreciation by the Economic Planning Agency.

##### 2. *Local governments and public organizations' property survey (designated No. 89)*

(a) *Purpose.*—The purpose of this survey was to clarify the actual status of domestic corporal properties possessed by general and special local public entities, including prefectures, municipalities, villages, and public organization, and to obtain basic data for the national wealth survey for 1955.

(b) *Scope.*—Investigation was made of land improvement districts and their federations, land improvement associations, flood control associations and their federations, general health insurance associations and federations within the area of cities, towns, and villages which were selected from prefectures on a nationwide sample basis.

(c) *Data used.*—Aggregate, details of fixed property, and inventory assets (or property) forms were used for the investigations.

3. *Corporate assets survey (designated No. 81)*

(a) *Purpose.*—The purpose of this survey was to investigate the fixed assets and inventories of corporations to determine their condition and to obtain basic data for estimation of the national wealth survey for 1955.

(b) *Scope.*—Approximately 6,300 establishments selected from among corporations throughout the nation on a sample basis were investigated.

(c) *Data used.*—Three types of forms, including establishment, fixed assets, and inventory forms, were employed in the survey. All forms were completed by personnel of the corporations sampled.

(d) *Survey date.*—For both fixed assets and inventories, the survey date used was December 31, 1955.

(e) *System of investigation.*—Investigation was made, as a rule, through statistics sections of villages, towns, cities, and prefectures.

4. *Sole proprietorship and partnership assets survey (designated No. 85)*

(a) *Purpose.*—The purpose of this survey was to investigate the fixed assets and inventories possessed by sole proprietors and nonlegal persons' corporations (hereinafter referred to as "sole proprietors") to determine their conditions and to obtain basic data for estimation of the national wealth survey for 1955.

(b) *Scope.*—The survey covered approximately 17,000 proprietors selected throughout the nation on a sample basis.

(c) *Data used.*—Three kinds of forms, including establishment, fixed assets, and inventory forms, were employed for the survey. Investigation was made by the enumerator (in the case of establishment forms) and by the self-enumerator (in the case of fixed assets and inventory forms).

(d) *Survey date.*—In the case of fixed assets, December 31, 1955, was used as the date of survey; for inventories, dates during the period from May 15 to June 10, 1955, were used.

(e) *System of investigation.*—Generally, investigation was made through statistics sections of villages, towns, cities, and prefectures.

5. *Household property survey (designated No. 86)*

The survey of household property was made by the Bureau of Statistics, Prime Minister's Office.

(a) *Scope.*—Investigation was made of approximately 7,300 households selected throughout the country on a sample basis. The districts employed for selection of these sample households were nearly the same as those used for the October 1955 "Labour Force Survey" made by Bureau of Statistics, Prime Minister's Office. Consequently, 978 districts in 528 cities, towns, and villages were selected, from which a list of households was prepared as of April 10, 1956, on the basis of an on-the-spot check.

The households to be surveyed were selected on the basis of systematic sampling. Special consideration was given to the method of sampling and designation of household members to be investigated in the case of quasi-households (single person) in making the above selection. Households within the premises of the national self-defense forces and reformatories were excluded from the list.

(b) *Household property*.—Household property surveyed included 83 items selected among articles used for the purpose of household economy. The total value of household property was obtained by multiplying the adjusted (by the ratio of items included in the survey to total household items) average asset value per household as determined by the survey, by the total number of households. The ratio used to adjust the average assets value per household was calculated on the basis of the results of a supplementary survey.

### III. SOME FINDINGS FROM THE 1955 AND 1960 NATIONAL WEALTH SURVEYS

#### A. MAIN FEATURES OF THE SURVEYS

The main features of the 1955 national wealth survey are summarized as follows:

1. The survey was carried out separating the national economy into general government sector, corporation sector, unincorporated business sector, and household sector.

2. The surveys were carried out on an ownership basis rather than on a user basis.

3. Adjusted replacement value of fixed assets was obtained by utilizing price indexes, and depreciation rates corresponding to the remaining lifetime of assets.

4. The concept and definition of assets were kept close to those employed in the national income accounts.

As mentioned in the former part of this paper, the 1960 national wealth survey was regarded as a survey intermediate to the 1955 and 1965 national wealth surveys. The main features mentioned above were duly followed by the 1960 national wealth survey.

The major differences between the two surveys were:

1. The adjusted replacement value of fixed assets for newly procured or removed assets since January 1, 1956, only were surveyed in the corporation sector, the local government, and the public body sector.

2. Household durable goods were not surveyed in the 1960 survey, and an estimate made only for buildings for residential use on the basis of existing data.

#### B. MAJOR PROBLEMS IN THE SURVEYS

Major problems involved in these surveys are summarized as follows:

1. The borderline between government enterprise function and administrative function was not clear. For instance, should hospitals other than hospitals for contagious diseases, university hospitals, etc., be treated as enterprises?

2. The borderline between semipublic community and private community was not clear. For instance, public halls, furnitures, and fixtures for tutelary god's ceremony owned by the former "Chyo Nai Kai" (community organized by the residents of towns and villages)—should this category not be surveyed in the household sector but be surveyed as a semipublic community survey?

3. The coverage of nonprofit corporations was not perfect. In the 1955 survey, nonprofit corporations located within the nominated primary sampling unit were all nominated as the sample items because of the difficulty of determining the universe of nonprofit corporations.

4. The borderline between households and minor unincorporated businesses was not specified clearly. In spite of the effort of the enumerators and the clear-cut definition, separation of these two sectors at this borderline was very difficult.

5. Should the national wealth survey be carried out only on the ownership basis?

6. It is desirable to study further the method of separating assets for business use from assets for household use in such unincorporated businesses as are operated along with household activity within the same house. This type of business is quite common in Japan.

7. Specific problems in the 1960 national wealth survey:

(a) The records about additions and retirements of assets in the general government sector (both central and local government) are not so complete; it has been assumed that there is a considerable volume of assets excluded from the survey.

(b) In the case of the corporation sector, to make the survey an easy one, the aggregate book value by commodity group and by year of acquisition at the latest ledger account closing date to the survey date was asked. Thus, it has been considered that a considerable volume of assets unlisted in the ledger of assets were excluded from the survey and there was no means to make the asset classification of ledger strictly consistent with the national wealth asset classification.

(c) In the case of the unincorporated business sector, the values of rental residential buildings were excluded. But this was caught in the household survey and transferred to unincorporated business in the real estate industry.



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APPENDIX I: PART F  
RELATIONSHIP OF BALANCE SHEETS AND WEALTH  
ESTIMATES TO NATIONAL INCOME ACCOUNTS

By JOHN A. GORMAN  
Office of Business Economics

## RELATIONSHIP OF BALANCE SHEETS AND WEALTH ESTIMATES TO NATIONAL INCOME ACCOUNTS <sup>1</sup>

This paper is concerned with the development of a national accounting structure which provides systematically for inclusion of stocks as well as the conventional flows. Substantive issues are approached from the standpoint of how different proposals affect the design of the accounts.

The first part of the paper sets forth a statement of transactions engaged in during a period. These transactions form the basis for the traditional national income and product production, appropriation and saving and investment accounts. I then describe a valuation statement, which contains information needed to supplement the saving and investment account to derive changes in a balance sheet statement. This latter statement provides the link between the flow data in the income and product accounts and the stock information shown on the balance sheet.

This set of accounts is essentially neutral with respect to the broad issues that most of us are really concerned with. Nevertheless, I have thought it useful to illustrate how divergent views on sectoring, capitalization, and valuation can be accommodated in the context of the set of accounts derived herein.

It is possible to draw up a simple statement of all the transactions engaged in by a given economic unit during a certain period. Table A contains an example of such a statement for all proprietors for the year 196*x*. Any transaction which tends to increase the cash balance of the economic unit is entered as a credit, while transactions which tend to decrease cash are entered as debits. The balance of this account (line 20) thus equals the change in cash holdings over the accounting period.

Note that such a statement contains a lot of information, but that traditional analytical concepts such as net income, saving, and inventory change do not appear in the account since they are not transactions. This statement serves principally as a checklist from which to construct the national accounts.

### PREPARING INCOME AND PRODUCT ACCOUNTS

The information contained in this transaction statement can be allocated into three analytically useful accounts for each unit: production, appropriation, and saving and investment accounts. Table B shows these accounts for proprietors. The production account portrays output and income and other costs of production (pt. I of table B). The appropriation account confronts income earned in production and transfer receipts with taxes, consumption, and saving (pt. II of table B). The saving and investment account shows saving and borrowing offset by investment and lending (pt. III of table B).

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<sup>1</sup> This paper does not necessarily reflect the views of the Office of Business Economics.

Let us now proceed to construct the three accounts for our nonfarm proprietors from the transaction statement. The production account includes the following transactions: sales, rents, the purchase of raw materials, wages, interest paid, and indirect taxes. But this is not all—we are measuring production and production need not be sold. In order to have a complete measure we impute the change in inventory during the period as a sale by the firm to its own savings and investment account. Further, we recognize depreciation—which is a valuation change not a transaction—as a charge against output in order to provide for information on net income. Finally, we impute a rent receipt of 18 to the production account for the entrepreneurs' rent of their homes. Entrepreneurial and net rental income becomes the balancing entry in the production account.

Entrepreneurial and rental income, and imputed rents enter the appropriation account from the production account while interest, dividends, and transfers received, and income taxes and consumer goods purchased are taken directly from the transaction statement. Saving is then struck as the residential balance in the appropriation account.

The saving and investment account includes net saving carried down from the appropriation account and depreciation and inventory purchases carried down from the production account. The purchase of physical and financial assets and borrowing are taken from the transaction account.

The accounts as now set up permit us to take account of economic realities which are not transactions since they are internal to the proprietors' account: entrepreneurial and rental income (dr B-I; cr B-II); depreciation (dr B-I; cr B-III); inventory change (dr B-III; cr B-I); imputed rent (dr B-II; cr B-I); and saving (dr B-II; cr B-III). A vertical consolidation of these three accounts would eliminate all of these items and yield a transaction account like table A; except that purchases and sales of similar items would be shown net rather than gross. The preparation of meaningful national income accounts may thus be viewed as a process of adding useful information to the bare record of transactions.

#### PREPARATION OF BALANCE SHEETS

An economic unit's balance sheet records the value of assets held and liabilities owed at a given moment of time. A balance sheet struck at the end of a period differs from that at the beginning of a period because (1) the collection of assets and liabilities has changed—new items have been added and old ones eliminated, and (2) there has been a change in the value of assets and liabilities held on both dates or acquired in the interim. The saving and investment account (B-III) shows the changes coming from transactions, while changes in value may be recorded in a valuation statement such as table C.

The valuation statement records changes during the period in the value of assets held at the end of the period. Increases in value are debited to this account, while decreases are credited. In the example given here (table C), changes in market value are recorded for selected assets. Asset and liability items not having entries in table C were assumed to not have changed in unit value during the period.

Depreciation is also recorded in this statement since it is essentially a reduction in the value of fixed capital. It would be possible to record here also other changes in valuation that are not due to market values if desired for analytical convenience.

We could prepare from table A a statement of changes in the balance sheet stemming from current transactions, but we already have such a statement in the saving and investment account (table B-III). However, the distinction between net saving and depreciation embedded in table B-III would not be in a statement of balance sheet changes coming from current transactions. Instead, the change in net worth from current transactions can be obtained by adding back depreciation to net saving; i.e., "gross saving" in table B-III.

We now have the two elements—transactions and valuations—of the change in the balance sheet. We now prepare a change in balance sheet account in table D. The portion due to transactions comes from table B-III, and that due to valuation comes from table C, with debits netted against credits for specific balance sheet items.

Having derived the change in balance sheet account, we now add the changes to the beginning balances to obtain the closing balance sheet (table E).

#### DERIVATION OF COMPLETE SET OF NATIONAL ACCOUNTS

We now move on to consideration of the relation between the national accounts and balance sheets for all sectors of the economy. The detailed construction of these tables is the same as for proprietors; in subsequent discussion we shall concentrate on the derivation of national accounts.

Following table E, there are eight statements accounting for six groups of transactors: proprietors, persons other than proprietors, nonfinancial corporations, financial intermediaries, government, and foreigners. Table 1 shows the transaction statement; table 2 the production account; table 3 the appropriation account; table 4 the saving and investment account; table 5 the valuation statement; table 6 the change in balance sheet statement; table 7 the beginning balance sheet, and table 8 the ending balance sheet. In each table, except table 1, three additional columns are shown: A combined account including foreigners, which is simply the arithmetic sum of each row; a combined national account, excluding foreigners; and a consolidated national account wherein the values of similar items on the debit and credit sides of the account are netted against each other.

In the production account (table 2) the following items have been "imputed": interest on consumer debts for persons other than proprietors; capital services exported to abroad for nonfinancial corporations; services performed without charge by financial intermediaries; and the value of work performed by civil servants for Government. When we consolidate the production account (column 9) we derive GNP. This GNP total can be broken down as many ways as is convenient: In the Survey of Current Business we break it down by type of purchaser, by type of product, by industry producing it, by legal form of the organization producing it, and by incomes and other charges against output.

The appropriation account (table 3) consolidates (col. 9) to give us net national product. We currently maintain appropriation accounts for persons (col. 10) Government (col. 5) and foreigners (col. 6), and consolidate the appropriation accounts for nonfinancial corporations and financial intermediaries into the production account. More analytic interest is focused on sector appropriation accounts than on the consolidated national appropriation account, partly because under present depreciation practice the net national product is not too meaningful and partly because the sector accounts confront purchases with the purchasers' incomes. It should be noted that personal and governmental purchases of durable goods are presently included in the appropriation accounts. The alternative of capitalizing such purchases is discussed below.

The saving and investment account (table 4) consolidates to form the customary national income saving and investment account (col. 9). I have assumed that we can satisfactorily solve the problem of float, so that total debits equal total credits for each type of financial claim in the combined accounts (col. 7). Combining the national accounts (col. 8) leaves imbalances in these financial claims, equal to foreigners' net transactions in them. These equal net foreign investment and are "left over" in consolidating the national accounts.

In the valuation statement (table 5) no equivalence between debits and credits is maintained. In effect unrealized capital gains or losses are attributed to the asset holder, and no offsetting capital losses or gains are attributed to the issuer. The contraentry for a valuation change in an asset is made to the holders' net worth.

Because of the treatment of valuation changes just described, the change in balance sheet account (table 6), and the balance sheet (tables 7 and 8), have balances in the financial claims of the consolidated national accounts (col. 9 in each table) which equal net foreign holdings, plus the excess of market value over issue price. This problem is discussed in the section on valuation of financial claims, below.

#### APPLICATION OF ACCOUNTING FRAMEWORK

The framework portrayed has been set up in terms of the present national accounts. We shall now consider modifications required to handle different sectoring, capitalization or valuation principles.

#### SECTORING

The full panoply of accounts just set up can only be derived for amalgamations of decisionmaking economic units. This creates no problem when the focus of wealth analysis is on the influence of wealth on the purchase, saving, lending or borrowing decisions of suitable classes of economic units. By the time the wealth inventory data become available, and provided we get the necessary funds, the Office of Business Economics will probably be able to provide the requisite sector details in the current accounts, at least for recent years.

However, the data provided by a wealth inventory can also provide the means for production function and capital output ratio analysis. Here the decisionmaking unit is inappropriate because of the prevalence and importance of the multiunit firm. Most workers in these

fields prefer establishment information. For such studies, information from the production account and selected capital items from the balance sheet are what is needed, and these items can be obtained on an establishment level. The Office of Business Economics has made substantial progress in breaking down the production accounts by establishment, particularly in the preparation of input-output tables and in gross product originating by industry. Thus, the outlook is that by the time the establishment-based plant and equipment statistics are available from the wealth inventory, we should have matching output data available.

Some analysts have expressed interest in placing the business activities of entrepreneurs in one sector and their personal activities in another. While I personally see little use in the distinction, a technique such as that employed in the present flow of funds accounts would be a reasonable compromise. In that system the entrepreneurial income is paid into the entrepreneurs' consumer appropriation account, and the increase in the net worth of the business is treated as a claim by the consumer on the business.

#### CAPITAL VERSUS CURRENT ITEMS

The present national accounts treat the following purchases of goods and services as capital items: business purchases of inventory, durable goods, and construction, and persons' purchases of housing. Purchases of all consumer durable goods and of government durables and construction are treated as current purchases in the appropriation accounts of the respective entities. No attempt is made to capitalize research and development outlays, advertising, or the acquisition of goodwill. In preparing the account tables, I have followed present OBE practice.

The distinction between current and capital items is crucial in setting up a fully integrated set of current and balance sheet accounts. If different distinctions are used in preparing balance sheets than in preparing income and product accounts, our set of accounts would be integrated only in the sense of being derived from a common transaction statement (table 1).

As noted earlier, there are two general types of studies where analysts might like common stock and flow numbers: production function studies and studies of the influence of existing stock on purchase decisions. I submit that the present NID capitalization treatment is most appropriate for the former, while the latter kinds of analyses might be best served by broader definitions of wealth.

The usefulness of the present NID distinction between capital and current is that it provides capital input data for the types of output which are priced in markets. If the definition of capital were widened to include, say, consumer and Government durables, we should have to cook up nonmarket priced output measures for the services of much of such capital. I doubt that we would really add much to our knowledge of production and income generation by this approach.

However, existing stocks of consumer and Government durables may play some role in decisions by these groups to purchase such items. In the absence of reliable data, I am somewhat skeptical about this. However, we cannot settle the question without formulating and test-

ing hypotheses. However, we cannot see how artificial measures of the services provided by consumer and Government durables will help this analysis of the influence of stocks on purchases.

One possible approach would be to enter such purchases in the saving and investment accounts, and not impute output to them. Depreciation of such purchases would enter the valuation statement, yielding the desired net stocks on the balance sheets. This might be a possible compromise, but has the drawback of departing from currently used measures of personal saving and Government surplus.

#### VALUATION OF FINANCIAL CLAIMS

Total debits do not equal total credits in tables 6, 7, and 8 for the following financial claims: cash, U.S. securities, other bonds, and stocks. The consolidated national wealth statement, column 9 of tables 7 and 8, includes (1) the value of "real" assets, (2) claims on foreigners, and (3) the excess of the market value of financial claims over issue value.

If we revalue the issuers' obligations to current market value, the debits and credits for the particular financial claim will equal. However, in order to balance within a sector account we must enter a contraentry to the revaluation of the obligation.

Such a contraentry could either be to the asset side—perhaps to some "goodwill" item—or to net worth. If the contraentry is made to the asset side, our consolidated national wealth would be identical with that derived from the accounts shown in this paper, except that the excess of market over issue value would appear as a "goodwill" item rather than mixed up with specific financial claims.

The other option—contraentry to net worth—keeps the excess of market over issue value from affecting the consolidated national wealth: we are left with (1) the value of "real" assets and (2) claims on foreigners. However, this involves us in a logical difficulty in the case of common stock. Common stock is a financial claim traded on the market. However, in the case of stock, what the market values is the net worth of the firm. Therefore, making the contraentry for stock to the net worth account would be a species of giving and then taking

away. The contraentry for common stock would thus appear to be a prime candidate for the asset side.

In the case of debt, a difference between current market value and issue price is not a revaluation of the firm, but a reflection of changes in interest rates. If market value is below issue price, the issuer is better off, because he issued his bonds at a lower rate of interest. Likewise, if market value is above issue price, the issuer is worse off, because he issued his bonds at a higher rate of interest. Since it is essentially a case of "well offness" the contraentry for debt should be to net worth.

If we make the contraentry for stock revaluation to "goodwill," and that for debt revaluation to net worth, our national balance sheet will consolidate out to (1) the value of "real assets," (2) claims on foreigners, and (3) the excess of the value of firms as going concerns over the resale or replacement values of the assets taken separately.

## ILLUSTRATIVE PROPRIETORS' ACCOUNTS, 196X

## A. Proprietors' transactions statement, 196X

[Billions of dollars]

	Debit	Credit
1. Sales of goods and services .....		150
2. Raw materials .....	65	
3. Consumer goods .....	50	
4. Houses .....	25	19
5. Plant and equipment .....	35	23
6. Rent .....	5	6
7. Wages .....	20	
8. Interest .....	10	15
9. Dividends .....		22
10. Transfers .....		1
11. Indirect taxes .....	25	
12. Income taxes .....	25	
13. U. S. securities .....	10	9
14. Accounts receivable .....	150	140
15. Accounts payable .....	50	80
16. Bank loans .....	1	5
17. Mortgages .....	15	20
18. Other bonds .....	5	6
19. Corporate stock .....	3	8
20. Change in cash balance .....	10	
21. Total debits and credits .....	504	504



*B. Proprietors' income and product account, 196X*

[Billions of dollars]

	Debit	Credit
<b>I. Production account:</b>		
1. Sales of goods and services (T).....		150
2. Rents (T).....	5	6
3. Imputed sales: to inventory account.....		12
4.     Owner occupancy of home.....		18
5. Purchase of raw materials (T).....	65	
6. Product originating: (Above credit minus debit).....	(116)	
7.     Wages (T).....	20	
8.     Interest (T).....	10	
9.     Entrepreneurial and rental income <sup>1</sup> .....	49	
10.    Depreciation.....	12	
11.    Indirect taxes (T).....	25	
12. <b>Total debits and credits</b> .....	<b>186</b>	<b>186</b>
<b>II. Appropriation account:</b>		
1. Interest (T).....		15
2. Entrepreneurial and rental income.....		49
3. Dividends (T).....		22
4. Transfers (T).....		1
5. Income taxes (T).....	25	
6. Personal consumption expenditures:		
7.     Consumer goods (T).....	50	
8.     Imputed rent on home.....	18	
9.     Personal saving.....	-6	
10. <b>Total debits and credits</b> .....	<b>87</b>	<b>87</b>
<b>III. Saving and investment account:</b>		
1. Personal saving.....		-6
2. Depreciation.....		12
3.     Gross saving <sup>1</sup> .....		6
4.     Plant and equipment (T).....	12	
5.     Houses (T).....	6	
6.     Inventory.....	12	
7.     Physical assets.....	30	
8.     Cash (T).....	10	
9.     U.S. securities (T).....	1	
10.    Accounts receivable (T).....	10	
11.    Accounts payable (T).....		30
12.    Bank loans (T).....		4
13.    Mortgages.....		5
14.    Other bonds (T).....	-1	
15.    Stocks (T).....	-5	
16. <b>Total debits and credits</b> .....	<b>45</b>	<b>45</b>

<sup>1</sup> Equals change in net worth from transactions.

NOTE.—Items marked (T) come from the transaction statement, either directly or after netting debits against credits. The net debits or credits are entered on the debit side if the item is customarily an asset, or on the credit side if it is customarily a liability or net worth item.

*C. Proprietors' valuation statement, 196X*

[Billions of dollars]

	Debit	Credit
1. Change in net worth from valuation.....		45
2. Plant and equipment.....	5	13
3.     Price change.....		3
4.     Depreciation.....		10
5. Houses.....	8	2
6.     Price change.....	8	
7.     Depreciation.....		2
8. Inventories.....		2
9. Land.....	6	6
10. U.S. securities.....	36	2
11. Other bonds.....		3
12. Corporate stock.....	20	2
13. <b>Total debits and credits</b> .....	<b>75</b>	<b>75</b>

*D. Proprietors' change in balance sheet account, 196X*

[Billions of dollars]

	Change in balance sheet	Due to transac- tions	Due to valuation
<b>Part A equals credit side:</b>			
1. Accounts payable.....	30	30	-----
2. Bank loans.....	4	4	-----
3. Mortgages.....	5	5	-----
4. Total liabilities.....	39	39	-----
5. Net worth.....	51	6	45
6. Total liabilities and net worth.....	90	45	45
<b>Part B equals debit side:</b>			
1. Plant and equipment.....	4	12	-8
2. Houses.....	12	6	6
3. Inventory.....	16	12	4
4. Land.....	30	-----	30
5. Cash.....	10	10	-----
6. U.S. securities.....	-1	1	-2
7. Accounts receivable.....	10	10	-----
8. Other bonds.....	-4	-1	-3
9. Stocks.....	13	-5	18
10. Total assets.....	90	45	45

*E. Proprietors' balance sheet, 196X*

[Billions of dollars]

	Beginning of year	Change in balance sheet	End of year
<b>Part A: Credit side:</b>			
1. Accounts payable.....	100	30	130
2. Bank loans.....	15	4	19
3. Mortgages.....	50	5	55
4. Total liabilities.....	165	39	204
5. Net worth.....	383	51	434
6. Total liabilities and net worth.....	548	90	638
<b>Part B: Debit side:</b>			
1. Plant and equipment.....	100	4	104
2. Houses.....	80	12	92
3. Inventory.....	70	16	86
4. Land.....	60	30	90
5. Cash.....	40	10	50
6. U.S. securities.....	18	-1	17
7. Accounts receivable.....	120	10	130
8. Other bonds.....	20	-4	16
9. Stocks.....	40	13	53
10. Total assets.....	548	90	638

## ILLUSTRATIVE NATIONAL ACCOUNTS, 196X

TABLE 1.—*Transaction statement*

[Billions of dollars]

	Proprietors	Persons other than proprietors	Non-financial corporations	Financial intermediaries	Government	Foreigners	Combined accounts including foreigners
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Part A: Credit side: total</b> .....	<b>504</b>	<b>559</b>	<b>1,632</b>	<b>243</b>	<b>390</b>	<b>56</b>	<b>3,384</b>
Sales of goods and services.....	150	---	650	15	---	25	840
Sales of used houses.....	19	10	---	---	---	---	29
Sales of used plant and equipment.....	23	---	10	1	---	---	34
Sales of land.....	---	---	8	---	---	---	8
Rent received.....	6	34	5	---	---	---	45
Wages received.....	---	190	---	---	---	---	190
Interest received.....	15	20	4	50	10	3	102
Dividends received.....	22	29	10	5	---	---	66
Transfers received.....	1	44	---	---	---	---	45
Indirect taxes received.....	---	---	---	---	100	---	100
Income taxes received.....	---	---	---	---	255	---	255
Borrowing, or sales or redemption of—	---	---	---	---	---	---	---
U.S. securities.....	9	19	10	8	25	10	81
Accounts receivable.....	140	---	310	---	---	---	450
Accounts payable.....	80	---	500	---	---	---	580
Bank loans.....	5	10	30	15	---	---	60
Consumer credit.....	---	100	30	20	---	---	150
Mortgages.....	20	40	---	35	---	---	95
Other bonds.....	6	12	50	2	---	10	80
Corporate stock.....	8	45	15	2	---	8	78
Life insurance premiums or benefits.....	---	6	---	10	---	---	16
Deposit creation.....	---	---	---	80	---	---	80
<b>Part B: Debit side: total</b> .....	<b>504</b>	<b>559</b>	<b>1,632</b>	<b>243</b>	<b>390</b>	<b>56</b>	<b>3,384</b>
Purchase of raw materials.....	65	---	200	10	---	10	285
Purchase of consumer goods.....	50	108	---	---	200	10	368
Purchase of houses.....	25	50	---	---	---	---	75
Purchase of plant and equipment.....	35	---	75	5	50	10	175
Purchase of land.....	---	---	---	---	8	---	8
Rent paid.....	5	30	10	---	---	---	45
Wages paid.....	20	---	100	30	40	---	190
Interest paid.....	10	30	25	12	20	5	102
Dividends paid.....	---	---	60	6	---	---	66
Transfers paid.....	---	---	---	---	45	---	45
Indirect taxes paid.....	25	---	75	---	---	---	100
Income taxes paid.....	25	75	150	5	---	---	255
Lending or purchases or repayment of—	---	---	---	---	---	---	---
U.S. securities.....	10	11	2	16	27	15	81
Accounts receivable.....	150	---	430	---	---	---	580
Accounts payable.....	60	---	400	---	---	---	450
Bank loans.....	1	4	10	45	---	---	60
Consumer credit.....	---	50	60	40	---	---	150
Mortgages.....	15	20	---	60	---	---	95
Other bonds.....	5	52	5	8	---	10	80
Corporate stock.....	3	55	---	---	---	20	78
Life insurance, premiums or benefits.....	---	10	---	6	---	---	16
Increases in cash balances.....	10	64	30	---	---	-24	80

TABLE 2.—*Production account*

	Proprietors	Persons other than proprietors	Nonfinancial corporations	Financial intermedi- aries	Government	Foreigners	Combined accounts including foreigners	Combined national account	Consolidated national account (derived GPN)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>Part A: Credit side:</b>									
Sales of goods and services.....	150		650	15			815	815	540
Rents received.....	6	34	5				45	45	
Imputed sales:									
Inventory change.....	12		60				72	72	72
Rents.....	18	36					54	54	54
Other.....		<sup>1</sup> 20	<sup>2</sup> 2	<sup>3</sup> 43	<sup>4</sup> 40		105	105	105
Total credits.....	186	90	717	58	40		1,001	1,091	771
<b>Part B: Debit side:</b>									
Purchase of new materials.....	65		200	10			275	275	
Rents paid.....	5	30	10				45	45	
Product originating:									
Wages.....	20		100	30	40		190	190	190
Net interest.....	10	30	23	5			68	68	68
Entrepreneurial and rental income.....	49	26					75	75	75
Profits before taxes.....			206	11			277	277	277
Depreciation.....	12	4	43	2			61	61	61
Indirect taxes.....	25		75				100	100	100
Total debits.....	186	90	717	58	40		1,091	1,091	771

<sup>1</sup> Service charge equivalent to interest paid on consumer debt.  
<sup>2</sup> Net capital services furnished to foreigners.

<sup>3</sup> Imported services furnished without payment.  
<sup>4</sup> Value of services furnished by civil servants assumed equal to wages paid.

TABLE 3.—Appropriation account

[Billions of dollars]

	Proprietors	Persons other than proprietors	Non- financial corporations	Financial inter- mediaries	Government (NID account III)	Foreigners (NID account IV)	Combined accounts including foreigners	Combined national account	Consoli- dated national account (derived NNP)	Personal account (NID account II) (1+2)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Part A: Credit side:</b>										
Wages.....		190					190	190	190	190
Interest.....	15	63					78	78	68	78
Entrepreneurial and rental income.....	49	26					75	75	75	75
Profits before tax.....			266	11			277	277	277	
Imports.....						25	25			
Dividends.....	22	29					51	51		51
Transfer payments.....	1	44					45	45		45
Indirect taxes.....					100		100	100	100	
Income taxes.....					255		255	255		
<b>Total credits.....</b>	<b>87</b>	<b>352</b>	<b>266</b>	<b>11</b>	<b>355</b>	<b>25</b>	<b>1,096</b>	<b>1,071</b>	<b>710</b>	<b>439</b>
<b>Part B: Debit side:</b>										
Personal consumption expenditures.....	68	207					275	275	275	275
Government purchases.....					290		290	290	290	
Exports.....						32	32			
Personal saving.....	-6	70					64	64	64	64
Undistributed profits.....			66	5			71	71	71	
Government surplus.....					10		10	10	10	
Net foreign saving.....						-7	-7			
Dividends.....			50	1			51	51		
Transfer payments.....					45		45	45		
Income taxes.....	25	75	150	5			255	255		100
Interest.....					10		10	10		
<b>Total debits.....</b>	<b>87</b>	<b>352</b>	<b>266</b>	<b>11</b>	<b>355</b>	<b>25</b>	<b>1,096</b>	<b>1,071</b>	<b>710</b>	<b>439</b>
<b>Part C: Memorandum:</b>										
Derivation of p.c.e.....										
Transactions.....	50	108								
Imputed rent.....	18	36								
Interest on consumer debt.....		20								
Imputed finance service charge.....		43								
Derivation of Government purchasers.....										
Transactions.....					250					
Imputed output of civil servants.....					40					

TABLE 4.—*Saving and investment account*

[Billions of dollars]

	Proprietors	Persons other than proprietors	Nonfinancial corporations	Financial intermediaries	Government	Foreigners	Combined accounts, including foreigners	Combined national account	Consolidated national account
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>Part A: Credit side:</b>									
Net saving or surplus.....	-6	70	66	5	10	-7	138	145	145
Depreciation.....	12	4	43	2			61	61	61
Subtotal: gross saving or surplus <sup>1</sup> .....	6	74	109	7	10	-7	199	206	206
Deposits <sup>2</sup> .....				80			80	80	
U.S. securities <sup>2</sup> .....					-2		-2	-7	
Accounts payable <sup>2</sup> .....	30		100				130	130	
Bank loans <sup>2</sup> .....	4	6	20				30	30	
Consumer credit <sup>2</sup> .....		50					50	50	
Mortgages <sup>2</sup> .....	5	20					25	25	
Other bonds <sup>2</sup> .....			45			\$ 10	55	45	
Stocks <sup>2</sup> .....			15	2		\$ 8	25	17	
Insurance liabilities (reserves) <sup>2</sup> .....				4			4	4	
Total sources of funds.....	45	150	289	93	8	11	596	585	206
<b>Part B: Debit side:</b>									
Plant and equipment.....	12		65	4			81	81	81
Houses.....	6	40					46	46	46
Inventories.....	12		60				72	72	72
Land.....			-8		8				
Subtotal: physical assets.....	30	40	117	4	8		199	199	199
Cash <sup>2</sup> .....	10	64	30			-24	80	104	4 24
U.S. securities <sup>2</sup> .....	1	-8	-8	8		5	-2	-7	4 -5
Accounts receivable <sup>2</sup> .....	10		120				130	130	
Bank loans <sup>2</sup> .....				30			30	30	
Consumer credit <sup>2</sup> .....			30	20			50	50	
Mortgages <sup>2</sup> .....				25			25	25	
Other bonds <sup>2</sup> .....	-1	40		6		\$ 10	55	45	
Stocks <sup>2</sup> .....	-5	10				\$ 20	25	5	4 -12
Equity in life insurance <sup>2</sup> .....		4					4	4	
Total uses of fund.....	45	150	289	93	8	11	546	585	206

<sup>1</sup> Equals change in net worth from current transactions.<sup>2</sup> The net of borrowing and repayments is entered in the credit side of the borrowers accounts and in the debit side of the creditors accounts.<sup>3</sup> In the foreign account, bonds and stocks are shown gross, since foreigners purchase

American securities and Americans purchase foreign securities. I believe it is analytically interesting to have a record of these transactions.

<sup>4</sup> Financial items left over in consolidation equal net foreign investment of 7.

TABLE 5.—Valuation statement

[Billions of dollars]

	Proprietors (1)	Persons other than proprietors (2)	Nonfinancial corporations (3)	Financial intermedi- aries (4)	Govern- ment (5)	Foreigners (6)	Combined accounts including foreigners (7)	Combined national account (8)	Consolidated national account (9)
<b>Part A. Credit side:</b>									
Change in net worth from valuation <sup>1</sup> .....	45	68	17	-8	6	4	132	128	
Plant and equipment, price decline <sup>2</sup> .....	3		7	1			11	11	
Plant and equipment, depreciation <sup>2</sup> .....	10		43	2			55	55	
Houses, price decline <sup>2</sup> .....		1					1	1	
Houses, depreciation <sup>2</sup> .....	2	4					6	6	
Inventories, price decline.....	2		4				6	6	
Land, price decline.....	6	5	8		9		28	28	
U.S. securities, price decline.....	2	3		10		2	17	15	
Other bonds, price decline.....	3	5		12		1	21	20	
Stocks, price decline.....	2	4		5		3	14	11	
Total credits.....	75	90	79	22	15	10	291	281	
<b>Part B. Debit side:</b>									
Plant and equipment, price rise <sup>2</sup> .....	5		21	2			28	28	
Houses, price rise <sup>2</sup> .....	8	20					28	28	
Inventories, price rise.....	6		18				24	24	
Land, price rise.....	36	30	40	2	15		123	123	
U.S. securities, price rise.....									
Other bonds, price rise.....				3			3	3	
Stocks, price rise.....	20	40		15		10	85	75	
Total debits.....	75	90	79	22	15	10	291	281	
<b>Part C. Net valuation balances:</b>									
Customary debits on balance sheet:									
Plant and equipment.....	-8		-29	-1			-38	-38	-38
Houses.....	6	15					21	21	21
Inventories.....	4		14				18	18	18
Land.....	30	25	32	2	6		95	95	95
U.S. securities.....	-2	-3		-10		-2	-17	-15	-15
Other bonds.....	-3	-5		-9		-1	-18	-17	-17
Stocks.....	18	30		10		7	71	64	64
Total net debit adjustment.....	45	68	17	-8	6	4	132	128	128
Customary credits on balance sheet:									
Net worth.....	45	68	17	-8	6	7	132	128	128

<sup>1</sup> This is net balance in this account.<sup>2</sup> The change in value of a stock of fixed assets equals the fall in the values set by the market. For analytic convenience I have disaggregated the "observed" decline into (1) that due to depreciation, (2) the residual obtained by deducting depreciation from

the "observed" decline. If the residual was positive, it is entered as a debit; if negative it is entered as a credit. Such a segregation is not needed to construct a balance sheet, but permits us to analyze two quite different phenomena: physical wear and tear and revaluations of future income.

TABLE 6.—Change in balance sheet account

[Billions of dollars]

	Proprietors	Persons other than proprietors	Nonfinancial corporations	Financial intermediaries	Government	Foreigners	Combined accounts including foreigners	Combined national account	Consolidated national account
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>Part A: Credit side:</b>									
Current surplus.....	51	142	126	-1	16	-3	331	334	334
Deposits.....				80			80	80	
U.S. securities.....					-2		-2	-2	
Accounts payable.....	30		100				130	130	
Bank loans.....	4	6	20				30	30	
Consumer credit.....		50					50	50	
Mortgages.....	5	20					25	25	
Other bonds.....			45			10	55	45	
Stocks.....			15	2		8	25	17	
Insurance liabilities.....				4			4	4	
<b>Total credits.....</b>	<b>90</b>	<b>218</b>	<b>306</b>	<b>85</b>	<b>14</b>	<b>15</b>	<b>728</b>	<b>713</b>	<b>334</b>
<b>Part B: Debit side:</b>									
Plant and equipment.....	4		36	3			43	43	43
Houses.....	12	55					67	67	
Inventories.....	16		74				90	90	90
Land.....	30	25	24	2	14		95	95	95
Cash.....	10	64	30			-24	80	104	124
U.S. securities.....	-1	-11	-8	-2		3	-19	-22	1-20
Accounts receivable.....	10		120				130	130	
Bank loans.....				30			30	30	
Consumer credit.....			30				50	50	
Mortgages.....				25			25	25	
Other bonds.....	-4	35		-3		9	37	28	1-17
Stocks.....	13	46		10		27	96	69	152
Equity in life insurance.....		4					4	4	
<b>Total debits.....</b>	<b>90</b>	<b>218</b>	<b>306</b>	<b>85</b>	<b>14</b>	<b>15</b>	<b>728</b>	<b>713</b>	<b>334</b>

1 See discussion of the valuation of financial claims.



TABLE 7.—Beginning balance sheet

[Billions of dollars]

	Proprietors (1)	Persons other than proprietors (2)	Nonfinancial corporations (3)	Financial interme- diaries (4)	Government (5)	Foreigners (6)	Combined accounts, including foreigners (7)	Combined national account (8)	Consolidated national account (9)
Part A: Credit side:									
Net worth.....	383	1,000	550	75	-184	140	1,964	1,824	1,649
Stocks.....			150	25		50	225	175	
Accumulated surplus.....	383	1,000	400	50	-184	90	1,739	1,649	1,649
Liabilities.....	165	470	760	550	284	20	2,249	2,229	1,260
Deposits.....				500			500	500	1,60
U.S. securities.....					284		284	284	1,76
Accounts payable.....	100		300				400	400	
Bank loans.....	15	20	60				95	95	
Consumer credit.....		250					250	250	
Mortgages.....	50	200					250	250	
Other bonds.....			400			20	420	400	1,114
Insurance liabilities.....				50			50	50	
Total liabilities and net worth.....	548	1,470	1,310	625	100	160	4,213	4,053	1,899
Part B: Debit side:									
Plant and equipment.....	100		430	30			560	560	560
Houses.....	80	400					480	480	480
Inventories.....	70		280				350	350	350
Land.....	60	50	50	4	100		264	264	264
Cash.....	40	280	120				500	440	
U.S. securities.....	18	110	50	30		60	228	208	
Accounts receivable.....	120		280			20	400	400	
Bank loans.....				95			95	95	
Consumer credit.....			100	150			250	250	
Mortgages.....				250			250	250	
Other bonds.....	20	220		46			250	250	
Stocks.....	40	360		20		20	306	286	
Equity in life insurance.....		50				60	480	420	1,245
Total assets.....	548	1,470	1,310	625	100	160	4,213	4,053	1,899

<sup>1</sup> See discussion of the valuation of financial claims.

TABLE 8.—Ending balance sheet

[Billions of dollars]

	Proprietors	Persons other than proprietors	Nonfinancial corporations	Financial intermediaries	Government	Foreigners	Combined accounts including foreigners	Combined national account	Consolidated national account
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>Part A. Credit side:</b>									
Net worth.....	434	1,142	691	76	-168	145	2,320	2,175	1,983
Stocks.....			165	27		58	250	192	
Accumulated surplus.....	434	1,142	526	49	-168	37	2,070	1,983	1,983
Liabilities.....	204	546	925	634	282	30	2,621	2,501	1,263
Deposits.....				580			580	580	136
U.S. securities.....					282		282	282	196
Accounts payable.....	130		400				530	530	
Bank loans.....	19	26	80				125	125	
Consumer credit.....		300					300	300	
Mortgages.....	55	220					275	275	
Other bonds.....			445			30	475	445	131
Insurance liabilities.....				54			54	54	
Total liabilities and net worth.....	638	1,688	1,616	710	114	175	4,941	4,766	2,246
<b>Part B. Debit side:</b>									
Plant and equipment.....	104		466	33			603	603	603
Houses.....	92	455					547	547	547
Inventories.....	86		354				440	440	440
Land.....	90	75	74	6	114		359	359	359
Cash.....	50	344	150			36	580	544	
U.S. securities.....	17	99	42	28		23	209	186	
Accounts receivable.....	130		400				530	530	
Bank loans.....				125			125	125	
Consumer credit.....			130	170			300	300	
Mortgages.....				275			275	275	
Other bonds.....	16	255		43		29	343	314	
Stocks.....	53	406		30		87	576	489	1,297
Equity in life insurance.....		54					54	54	
Total assets.....	638	1,688	1,616	710	114	175	4,941	4,766	2,246

<sup>1</sup> See discussion of the valuation of financial claims.

## COMMENTS ON MR. GORMAN'S PAPER

By Stanley J. Sigel

Although the primary focus of the present report on wealth is on the improvement of the statistical and conceptual basis of estimates of natural real wealth, it is important at the earliest stage possible to give serious consideration to how such concepts and measures can be integrated into broader frameworks of national accounting—sector balance sheets, including financial claims, and an integrated flow structure of national accounts covering both the traditional income and product accounts and financial flow accounts. Mr. Gorman's paper in calling attention to the problem of integrating wealth estimates into a general framework of social accounting is a welcome supplement to the report.

The main purpose of his paper is to investigate the nature of the links between wealth estimates and the national income accounts. The approach used is to place the wealth estimates within a framework of a complete structure of sector balance sheets and to place the national income accounts within a framework of a complete structure of sector flow accounts (integrating income and product and financial flows). The balance sheet system and the integrated flow system are given the same sector structure and the same asset and liability category structure; one can thus focus on valuation problems as the main conceptual and statistical difficulties in linking the flow and balance sheet systems. In approaching the problem in this way, Mr. Gorman has made his paper one devoted as much to the problems and characteristics of an integrated structure of national accounts as to questions of the valuation linkage.

Mr. Gorman's paper is extremely brief and he obviously has not attempted or intended to present a definitive paper on the subject. The account tables he presents have dummy numbers in them and thus do not necessarily represent the way the author would actually set down an integrated structure for the United States that was intended to be implemented statistically and to be used analytically. Nevertheless, he has set down an integrated structure of flow and balance sheet accounts which is quite detailed and specific. He has made choices and decisions; he has gone along with or departed from treatments that have been suggested elsewhere or are already incorporated elsewhere in published systems of accounts. Moreover, whatever his intentions in the matter, readers, whether justifiably or not, may, because of Mr. Gorman's official position, conclude that the paper is at least a reflection of serious comprehensive thinking on the subject rather than merely representing an offhand generally illustrative structure done for the sole purpose of dealing with the problem of valuation linkage at a broad schematic level.

Thus, because the paper may conceivably come to play some role in future discussions on the subject of integration of accounts, because it appears in a document making serious recommendations on the path of some aspects of future national accounting work, because the system given in it is as detailed as it is, and precisely because it is so short with very little discussion on the many considerations that went into the particular system it presents, it is appropriate

to raise the question of the place of this paper in the discussions and work on integrated accounts and financial accounts that have been going on in the past several years in governmental and academic circles here in the United States, at international meetings on the subject, and elsewhere abroad. What seems to be called for, whatever the exact intentions of the author, is an evaluation of the paper in terms of its adequacy as a summary reflection of the present state of the general discussion in this area, its ability to give the interested reader a clear idea of the problems to be faced, its contribution to moving us farther along the road to an integrated system, and its usefulness as a specific basis for further fruitful discussion pointing to such an integration.

From these points of view, the paper suffers from certain deficiencies, some general and some quite specific. The remainder of this comment will attempt to spell out some of the characteristics of the paper that lead to this judgment, starting with some general points and going on to more detailed comments.

One set of difficulties arises in the paper in connection with the relation between the present income and product accounts and the structure in the paper. There are three different points here. First of all, the general approach of the paper has been somewhat too narrow in one respect. In spelling out the integrated system for the purposes of this paper, the author has apparently set himself the task of preserving the present national income and product accounts in all their existing detailed treatments. That is, he is basically asking the question of how to tack sector structure and financial flows onto the present income and product accounts rather than the question of what should be the characteristics of an adequate integrated system. These are not necessarily very different questions and it is unlikely that a large number of major changes would have been suggested by asking the more general question.

Nevertheless, from the point of view of the use of the paper as a basis for future discussion, it is to be regretted that this occasion of setting down an integrated structure was not used as a general opportunity of facing the problem areas that may arise in fitting in (or perhaps spreading out is the more appropriate phrase) the income and product accounts. There is reference in the paper to two possibilities of change—consumer durables as a capital outlay, and a government capital account. But there are others not mentioned that should at least be faced. For example, how in an integrated system should Government life insurance and Government employee retirement be treated? If claims on private insurance and private pension plans enter households balance sheets and saving and investment accounts, why should claims on Government insurance and retirement be omitted? Would development of an integrated system perhaps change the weighting of considerations that lead to the present treatment? The answers to such questions are not necessarily obvious; the important point is that the general approach should be such as to encourage the raising up and confrontation of such questions and problems.

The treatment of property income flows is another area where the setting up of an integrated system with specific full sector accounts may create problems or suggest changes in some details of the income and product accounts.

Another point in the general area of tying to the present national accounts is the impression that one seems to get from the paper that the particular treatments shown in the integrated structure there follow directly somehow from the specific characteristics of the present national accounts. This impression, which may not have been intended by the author, can often be misleading. While many of the specific treatments are directly dictated by the decision to follow the present accounts, many of the important sectoring, account, and transaction decisions are not so closely linked—alternatives exist which would have been equally consistent with the present income and product accounts. For example, the sectoring choice made in the paper for the household-proprietor area is not demanded by anything in the income and product accounts; the sectoring choice in the flow of funds accounts, for example, is equally consistent conceptually and is probably easier to derive statistically from the income and product accounts. Similarly, the lack of a production account for the foreign sector does not follow from anything in the structure of the income and product accounts; once it is decided to separate the national production account into sector subaccounts, the only restriction imposed by tying to the present income accounts is that the sector production accounts so set up consolidate down to the present national production account. Within the constraint of consistency with the present income accounts, there is often a surprisingly wide range of choices of treatment in the integrated system; the choices fall back on considerations of analytic suitability, statistical availability, and presentational simplicity and convenience. A proper emphasis on this can put the discussion of the problems of creating an integrated system in somewhat clearer focus.

The third point concerned with linking to the present income and product accounts is almost exactly opposite to the first point. There are several places in the system set down in the paper where the treatments have not fully met the needs of the present income and product accounts. For example, taxes in the income and product accounts being on an accrual basis, a financial category for tax liabilities is needed—there is no provision for such entries in the paper. Similarly, the concept and method of measurement of Government purchases in the income and product accounts demand financial entries for Government payables and receivables—there are no such entries. These omissions undoubtedly stem from the schematic and illustrative character of the paper but the failure to show the complete structure of entries required by consistency with the present income and product accounts may create difficulties for use of the paper as a basis for future discussion. In addition, for the tax liability entry there may be special valuation adjustment problems that would have been interesting to discuss in connection with the valuation linkage between balance sheets and flow accounts.

The brief compass of the paper and its lack of complete discussion both of the general problems in the area and of the considerations going into each specific decision results in another general feature of the paper—the reader could scarcely gather from it that there have by now been years of discussion and work either directly on the specific subjects of the paper or on topics so closely related that particular parts of the work are directly relevant. Such work includes the flow of funds work at the Federal Reserve (which includes sector partial

balance sheets as well as flow accounts and has been concerned with many of the problems of tying systems together), the national balance sheet studies of the National Bureau's Postwar Capital Markets Project, and their "Income and Wealth Series" volume 26 on "The Flow-of-Funds Approach to Social Accounting" (which includes an article specifically addressed to the problem of integrating flow of funds and income and product accounts), the sessions and reports of the Conference of European Statisticians on the subject of financial assets and liabilities and their incorporation into national accounting systems, as well as work increasingly pursued in several countries.

The problem is not that reference was not made to the body of this work. (Whatever other difficulties this simple omission might cause, it would not by itself affect the usefulness of the paper). What is more serious is that there would appear to be indication that the paper is substantively weaker because of failure to incorporate or take into account what has proved useful and valid in the previous discussions and decisions. This is by no means to say that the previous work has all been successful, or has entirely focussed on the question of an operational integration of accounts, or has or should have any protected position in subsequent work. But, an illustrative paper such as this one by not taking maximum advantage of work already done, by not concentrating more on the problem areas revealed or not dealt with by previous work, and by not pointing up departures from or differences with existing work has limited the extent to which it is suitable to serve as an adequate representation of the present state of work and thinking in the area and as a basis for productive discussion.

There are several areas of discussion and treatment in the paper where more extensive exploitation of the existing bodies of work and experience might have been advantageous. Among these areas are the classification of financial claims, netting and grossing, the nature and incidence of discrepancies, and some sectoring problems. In addition there are instances of somewhat obscure and confusing terminological and definitional usage that might have been avoided.

The illustrative character of the paper also has a limiting effect. While the system of accounts is presented in considerable detail, there are many cells or categories of significance in the real world that are missing entirely or are left blank. In these cases it is impossible to know whether a given category is missing, or a cell blank, because the author is dealing with a simplified scheme where he is not interested in showing all items, even grouped, because the item is considered impossible by definition, is netted or grouped elsewhere, is assumed at zero to avoid complication in a brief paper, is considered so trivial in the real world that it isn't worthwhile carrying through the example, or has simply been neglected. Whatever the reason, certain characteristics both of the real world and presumably also of an adequate national accounting representation of the real world are entirely missing.

Some of the omissions relate either to problem areas or to items whose treatment would be significant in revealing the general tone and analytic orientation of parts of the system. This characteristic of the paper, in several instances, results in the reader not being able to see all the consequences of the general approach and of the specific deci-

sions used in the paper. The reader, thus, cannot evaluate the structure and does not really get a feeling for how the author would actually construct an integrated system. What is needed at this stage in the discussion and work is not simply a broad general schematic view but some indication of the full range of the specific characteristics of the system under discussion, including the less obvious points and the more awkward consequences of the basic and supporting decisions.

The general characteristics of the paper discussed so far affect many of the specific features of the system of accounts presented there. The following paragraphs will discuss some of the specific features of the structure in light of the general comments.

In the area of sectoring decisions, the only sectoring problem treated explicitly in the discussion in the paper is the treatment of the combined noncorporate-household complex. There are three obvious choices (and also some others)—(a) to group all proprietors and their businesses and all households (of both proprietor and nonproprietor families) in a single sector; (b) to put all nonproprietor households and the household activities of proprietors in one sector and the business activities of proprietors in another sector (this is the approach used in the flow of funds accounts); (c) to put proprietors and their families and their business and household activities in one sector and all nonproprietor households in another. Gorman has chosen the last. This is an area where nothing that one does can be really satisfactory; the choice made will depend on the weighing of the conceptual, statistical, and analytic advantages and disadvantages of the various alternatives.

I might be inclined to question on various grounds the choice made in the paper,<sup>1</sup> but the important point to be made here is that, in the structure of accounts presented, several of the entries required by the sectoring choice adopted have not been made. For example, there are no entries for wage receipts, life insurance, consumer credit borrowing<sup>2</sup> or consumer credit lending for members of proprietor-families. These are all, of course, items for which it would be extremely difficult to arrive at estimates. (The same is true, however, of the split in consumption expenditures between the two sectors, which is entered.) The failure to make all the entries required for the sectoring choice may, thus, confuse the unwary reader in his attempt to evaluate the structure presented.

Before leaving the household sectors, it might also be noted that the production account for persons other than proprietors seems to be lacking in some of the entries needed to take care of the productive activities of domestic servants, nonprofit organizations, and owner-occupied-house operations, thus raising the question as to what sectoring was intended here.

A number of other questions on sectoring treatment can be raised. Where, for example, are noncorporate financial enterprises (princi-

<sup>1</sup> The stated basis of the choice is that the author sees "little use in the distinction" drawn in alternative (b) between proprietor-family business and household activities. This implies that there are no occasions where a system of accounts enabling all business to be combined together in a simple fashion would be analytically convenient; that the business activities of all proprietorships, including large industrial and financial partnerships, are intimately and inextricably linked with the household activities of the families of the proprietors or partners along the model of the corner grocery store or the small family farm.

<sup>2</sup> As will be discussed in connection with netting, their consumer credit borrowing might conceivably have been omitted because of netting against the sector's consumer credit assets, but as there is no asset entry either, it is clear that this item has just been omitted.

pally brokers and dealers)? There are no nonfinancial entries (particularly no entrepreneurial income) that would indicate they are in the financial intermediaries sector; on the other hand, the financial entries in the proprietors' sector account do not seem to provide for them either.

The entries shown for the Government sector leave some question as to the nature of this sector account. The sector location of Government enterprise is not really clear. The production account entries of the Government sector do not seem to make provision for these enterprises; the absence of entries for Government lending or liability for deposits raises similar questions. Does the lack of entries for transfer payments *within* the Government sector and for debt transactions *within* the Government sector reflect a desire for illustrative simplicity or a consolidation of Federal and State and local governments within the account? The sector location of Treasury monetary functions is also left uncertain since there are neither the currency or money supply liability entries required if such functions are in the Government sector nor the Treasury currency entries needed to reflect the shift of these functions to the banking part of the financial intermediaries sector.

The foreign sector account also raised questions. There are no entries at all in the production account. Again, is this illustrative simplicity or an indication that the whole production account of the foreign sector is shifted to one of the domestic sectors, say to non-financial corporations? In terms of a system of entries to accomplish this, there is no real difficulty, but what would that then imply as to the nature of the sector production accounts? There is indication that foreign net interest is handled through an imputation with the non-financial corporations sector but in general the not entirely easy question of how to handle net income originating abroad within a system of explicit sector production accounts may have been avoided by having zero entries in the relevant cells. Here again the reader may be confused in his judgment as to usefulness and manageability of a given account structure by illustrative entries that avoid the real problem areas.

The financial area of the accounts is particularly affected by the general characteristics discussed above. For example, the financial transactions and claim categories used in the paper are riddled by omissions. Here, as in other instances, it isn't clear what is illustrative material not meant to be taken literally or seriously, what is deliberate departure from existing systems, what is deliberate choice recommended as a feature of future work. In any case, there are some respects in which what is recorded in the paper is inadequate even as illustration. A simple listing of the kinds of financial claims not covered even in grouping or in an "all other" category will indicate the range of the problem. The omitted items include gold, Treasury currency, currency,<sup>3</sup> time deposits,<sup>3</sup> savings and loan shares, domestic sectors' holdings of foreign currencies, claims on pension funds, the range of Government liabilities not covered by "U.S. securities," Gov-

<sup>3</sup> There is a category called "deposits" on the liability side (thereby excluding currency) and "cash" on the assets side (thereby excluding time deposits).



ernment loans, State and local government securities,<sup>4</sup> commercial mortgages,<sup>5</sup> most aspects of security credit, direct investment from and to abroad, tax liabilities, and a host of miscellaneous loan, subscription, and deposit claims.

In addition, even for the categories that are listed, there are significant blanks in many sector entries. Thus neither the Government nor financial intermediaries have any cash holdings; State and local governments hold no U.S. Government securities (as indicated above, this may be an indication that the Government sector is completely consolidated); the Government has no accounts payable or receivable (although these are explicitly called for by the definition and calculation of Government expenditures in the income and product accounts); there is no bank lending to financial institutions or to the rest of the world; proprietors hold no consumer credit paper nor do their families have consumer debts; proprietor families also have no insurance assets; financial intermediaries purchase no stock (which raises the question of where mutual funds and private pension plans are treated in the sector structures); the Government holds no mortgages, nor has it any deposit liabilities.

Transactions in land and other existing assets have always been one of the most troublesome statistical problem areas in setting up sector accounts; even at an illustrative level, a single entry for Government purchases from corporations is not an adequate indication of where in the structure of accounts such entries would be needed even on a net basis. In particular, the sectoring break between proprietors and households adopted in the paper makes explicit entries for such transfers of property more necessary and harder to avoid behind the rationale of netting.

The apparent nature of the consolidation and netting treatments utilized in the financial area in the paper raises some questions. Both in the balance sheets and the saving and investment account, there is some indication that the kind of netting and consolidation intended for many of the categories may obscure the financial relationships involved and may hamper many analytic uses of the whole structure of accounts.

With a few explicit exceptions, no sector account is shown as having both an asset and a liability entry for a given financial claim category. This could perhaps be partly explained in terms that there are not enough kinds of entries in the illustrative structure actually to illustrate the treatment proposed for certain situations. But it can probably be fairly concluded that there seems to be an underlying principle that, in general, each sector's asset holdings of a given financial claim category and its liabilities under that category be netted together and only a single figure shown for the net asset or net liability (depending on the sign) or for net debit or net credit. This can be inferred from the fact that where it was specifically desired to show both an asset and liability entry for a given sector for a given type of claim, either explicit provision is made for it in the structure of entries of the transactions account (as in the case of accounts payable and

<sup>4</sup> There is a category "other bonds," but since there is no liability entry for it in the Government sector, it apparently doesn't cover State and local issues.

<sup>5</sup> There is a "mortgage" category, but, since only the two sectors containing households are shown as debtors, presumably commercial mortgages are neglected.

receivable), or an explicit footnote is provided to explain the "unusual" treatment (as in the case of entries for stocks and bonds in the foreign sectors accounts).

The items affected by this depend on the kind and scope of sectoring. In the present illustrative structure, with a single sector for all financial institutions and a single government sector, practically every financial category (including those omitted from the tables in the paper) would appear on both the asset and liability sides of at least one sector, with claims on life insurance reserves and on pension funds the only obvious exceptions coming immediately to mind.

General netting of assets against liabilities of the same category in a given sector account is, for the most part, both unnecessary statistically and disadvantageous analytically. Related to the general question of netting is the issue of (and meaning of) sector consolidation. This is not mentioned in the present paper and because of the large number of blank cells it is difficult to infer the implicit treatment. There has been considerable discussion (in connection with financial accounts), both here and internationally, of the different kinds of netting, grossing, consolidation and their statistical, structural, and analytical significance. While the conclusions reached and treatments adopted so far are always subject to further consideration and evaluation, the discussion up to now in the flow of funds literature has succeeded sufficiently in separating out, and focusing on, the various strands of the topic that it should form at least the background of future discussion.

Another example of an area where there seems to be little reflection in the paper of the full range of discussions in earlier work and where the use of dummy entries tends to obscure the problems that must be faced is the question of the appearance and incidence of discrepancies in the accounts. The problem of how to handle discrepancies in the accounts is a much more pressing one in a system that both explicitly records full sector accounts and records both financial and nonfinancial entries than it is in a structure like the present income and product accounts. Because of this, in the flow of funds work there has had to be a considerable amount of attention devoted to the problem of the origin and incidence of timing, valuation, classification, and sector allocation inconsistencies and to the problems of the location and significance of the resulting discrepancies. There has developed over the years a comprehensive and systematic view of and approach to the problem. In an illustrative system, like that in Gorman's paper, where dummy hypothetical entries are utilized, one should not expect to find the problem of discrepancies illustrated in the sample accounts themselves. (In fact, it might be extremely difficult to set up a realistic dummy set of inconsistencies and discrepancies for illustrative purposes.) However, what reference there is to the problem in the paper itself is brief and somewhat confusing. A discrepancy problem is discussed only in connection with the consolidated saving and investment account and there the impression is given that the only serious problem is one of float, i.e., arising from timing inconsistencies. The discrepancy problem is more pervasive, popping up in many sector accounts and many transaction categories.

Moreover, where the discrepancies show up, as opposed to where inconsistencies occur, is to some extent determined by the design of

the accounts and of the statistical implementation of the accounts; they, therefore, should be discussed even in a general paper. The identification of the discrepancy problem in the consolidated savings and investment account as one of the float (i.e., timing) is too narrow; other inconsistencies affect the construction and interpretation of this account. The author, in any case, mentions this aspect of the discrepancy only in order to assume it away. What is needed, of course, is a reference to or consideration of what might be the consequences for the system of accounts of not being able to solve the problem of discrepancies.<sup>6</sup>

One of Mr. Gorman's major contributions in the paper is in his discussion of the valuation linkage between the flow accounts and the balance sheets and the provision of a valuation account to perform the bridging. The conceptual problems surrounding the question of valuation are among the most troublesome and unsettled in national accounting and his systematic approach permits a valuable focusing on the various issues that have to be met.

There are several questions in the area of valuation change and its recording that are raised by his discussion and tabular presentation. Here again, as in the case of the parts of the paper already discussed, the schematic and illustrative nature of the paper make it somewhat difficult to evaluate either the examples that are given or the significance of items not illustrated. So that any comment runs the risk of being off focus in terms of what Mr. Gorman would put down in a complete discussion and presentation.

Eligibility for inclusion in the valuation statement seems to be based on a distinction drawn between "changes in market value" and "other changes in valuation that are not due to market value." The first would seem to be recorded automatically and the latter only "if desired for analytic convenience." Surely analytic "convenience" is the primary consideration in both cases. Moreover, it would seem reasonable that in some sense it is most appropriate to discuss the coverage of the valuation statement only in formal terms—for example, the valuation statement shall include entries for all items where there is an inconsistent valuation, for whatever reason, between the basis of recording in the flow accounts and the basis of recording in the balance sheets. The substantive questions of valuation, and thus of inclusion and exclusion in the valuation statement are shifted to the discussion of the nature of the valuation of the items in the balance sheet. This in turn will depend on the analytic uses envisaged for the sector balance sheets.

The difference in emphasis here may be related to Gorman's apparent preference for viewing the valuation statement as somehow more basic than, or prior to, the closing balance sheet, in the sense that he has the closing balance sheet derived from the addition of entries from the flow accounts and the valuation statement rather than treating the valuation statement as a reconciliation between the two basic bodies of statistics. It is not clear whether this is an analytic or statistical preference or both.

<sup>6</sup> For a discussion of how the structure of discrepancies throughout the system affects the consolidated saving and investment account and the relation between "net foreign investment" and "net lending abroad" see the last two paragraphs of the section on discrepancies in "A Quarterly Presentation of Flow of Funds, Saving, and Investment," Federal Reserve Bulletin, August 1959, pp. 828-859, at 857-859.

The major valuation issue discussed in the paper is the question of what system of contraentries yields the most meaningful consolidated national wealth statement if issuers' obligations are revalued to current market value. But there is no discussion, aside from the implied one on the effect on the consolidated national balance sheet, of the prior questions of why one would want liabilities in current market value, or more generally of what would be the most generally, analytically useful way to record liabilities in the sector balance sheets. In such a full discussion, it would not seem to me that the needs of arriving at the national balance sheet through a mechanical consolidation of sector balance sheets should be given much weight since the national balance sheet can be derived directly from the physical wealth estimates and estimates of net foreign claims that would have to be prepared for the derivation of the sector statements in any case.

There are a few generalizations in the discussion on valuation that might be questioned. It is, for example, not quite so definite as the wording of the paper would have it that all changes in stock prices can be interpreted as the market's evaluations of the net worth of the firm—the market is sometimes also evaluating itself. Conversely, in the case of debt, it is not true that all differences in issue price and market value reflect only interest rate changes—the market is sometimes also evaluating the firm. The valuation adjustment for physical assets between depreciation and price change is surely not as neatly separated either statistically or conceptually as is implied. Depreciation reflects average rates of obsolescence in some sense as well as physical wear and tear and thus to some extent reflects price declines of the assets not related to physical deterioration.

As stated in the beginning of this note, the basis for most of the comments—that is, the questions of the suitability of the system presented in the paper to serve as an effective basis for productive discussion of the problems of creating an integrated system of accounts—may or may not be at all related to the purposes and intentions of the author in preparing the paper. In this sense many of the comments may be completely unfair and irrelevant in the context of the particular paper. In the larger context of work toward an integrated system of accounts, it is hoped that the remarks have some relevance.

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NOTE.—Actually, we had invited Mr. Gorman merely to present, in summary fashion, a general framework showing the relationship of wealth and balance sheet estimates to the national income and product accounts. Nevertheless, we reproduce Mr. Sigel's full remarks since they are indeed relevant to the more detailed discussions we hope will take place at a later stage.

JOHN W. KENDRICK.

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APPENDIX I: PART G  
NOTES ON MEASURING CAPACITY BY CENSUS  
ENUMERATION

By ALMARIN PHILLIPS  
University of Pennsylvania

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# NOTES ON MEASURING CAPACITY BY CENSUS ENUMERATION

## INTRODUCTION

The use of the census of manufactures for measuring industrial capacity and the degree of capacity utilization has been handicapped by two factors. First, there has been no generally agreed upon definition of capacity for this purpose and, second—though not unrelated to the first—it has proven difficult to frame a set of questions which would at once be unambiguous and provide indicia of the desired capacity magnitudes.

These notes attempt to develop an operational concept of capacity through the use of a linear programming approach to the firm. In addition to providing a clear definition of capacity, this mode of presentation has other advantages. The meaning of balanced and unbalanced facilities is clarified, output restraints imposed by capital stocks are distinguished from those imposed by other factors, and possible differences between capacity measured in terms of output and capacity measured in terms of capital stocks are illustrated.

The paper represents no more than an exploratory venture. The purpose is to search for pitfalls rather than to propose definitive procedures. While it seems feasible to obtain capacity estimates from census surveys, no attempt is made to formulate the questions which census forms might pose. A list of relevant areas to which questions might be directed is included in the final section.

## CAPACITY OF THE INDIVIDUAL ESTABLISHMENT

A census establishment can be viewed as a collection of  $m$  processes (or types of capital goods) capable of producing various quantities of  $n$  goods. Output is restrained by the existing stocks of capital goods, by the more or less technically determined production characteristics of the capital goods, and by economic, technical, and social considerations affecting the time-intensity of capital usage (i.e., the length of the workday and workweek, number of shifts, amount of downtime, etc.). From the combination of these, the output restraints imposed by the capital stocks can be expressed:

$$A \cdot X \leq Y, \quad (1)$$

in which  $A$  is a matrix of  $a_{ij}$  coefficients describing the technically determined production characteristics,  $X$  is a row vector  $(x_1, x_2, \dots, x_n)$  of output rates for the products, and  $Y$  is a column vector  $(y_1, y_2, \dots, y_m)$  reflecting the combined effects of the sizes of the stocks of capital and the time-intensity of their use. The inequalities in (1) form an  $n$ -dimensional polyhedron, the outer surface of which is here defined as the "capacity" of the establishment. Given  $A$ , capacity is a function of only the capital stocks and their time-intensity usage.

While capacity is defined by the capital stocks, other types of restraints are typical. Of particular relevance to capacity measures are restraints associated with demand. Given prices, demand restrictions would appear as:

$$X \leq X, \quad (2)$$

where  $X$  is a vector indicating the maximum amounts of each of the  $n$  goods that can be sold.

Another typical restraint arises from the limited availability of input materials and services. These exist because of fixed factor supplies and because of the capacity limitations of supplying firms and would appear as:

$$B \cdot X \leq Z, \quad (3)$$

where  $B$  is a matrix of  $b_{kj}$  coefficients showing the amount of each of  $r$  inputs used per unit of output of the several products and  $Z$  is a vector ( $z_1, z_2, \dots, z_r$ ) giving total input limitations.

A necessary (but not sufficient) condition for the simultaneous full utilization of all process capacities is that the  $m$  individual surfaces comprising the entire outer surface of (1) intersect at a unique point in  $n$ -space. Stated alternatively, it is necessary that:

$$A \cdot X = Y \quad (4)$$

have a solution. If this condition does not hold, there is no output mix which will fully utilize the capital stock. "Slack" will exist in at least one process and may exist in as many as  $(m-2)$  processes by reason of the capital stock restraints alone.

This provides further definition. An establishment has balanced capacity when an output mix exists which would simultaneously utilize all processes fully [i.e., when (4) has a solution]. An establishment has unbalanced capacity when this condition cannot be met. Unbalanced capacity can take two forms. If the surface formed by one of the individual equations implied by (4) lies outside the limits of the other equations of the system in all  $n$  dimensions, the process to which this equation refers is redundant. With redundant unbalance, in addition to the inability to use fully all processes simultaneously, there is at least one process which individually cannot be fully utilized no matter what the output mix. In nonredundant unbalance, where all that is lacking is a unique point of intersection, some output mix will fully utilize each of the processes even while no single mix will fully utilize them all simultaneously. The importance of the distinction between redundant and nonredundant unbalance is that in the former there is one type of capital that does not enter the meaningful capacity definition.

A lack of balance in capital stocks causes a lack of correspondence between excess capacity measured by output and excess capacity measured by the degree to which capital stocks are utilized. With balanced capacity, and the assumption of linear production relations, the ratio of actual output to capacity output would be equal to the ratio of capital stock being utilized to total capital stock so long as the relative mix of output is the same as the mix at full balanced capacity utilization. But, without attempting precisely to define the term, as the degree of unbalance increases, the correspondence between the ratio

of actual to capacity output and the ratio of stocks utilized to total stocks tends to disappear. The latter cannot be unity even when the former is. One way of measuring unbalance, then, is to compare these two ratios. Note, however, that the ratios could be different because the output mix is other than that compatible with simultaneous full utilization or because of nonlinear production functions.

If excess capacity is measured by the ratio of stock utilized to total stock, unbalance will make an excess appear even when all the demand restrictions in (2) are redundant. Similarly, estimating capacity output by dividing this ratio into actual output may give an incorrect result since, when the restrictions in (2) are redundant (and no other noncapital restraints are in operation), total output cannot actually be increased despite the existence of unused facilities. Even when the demand restrictions in (2) intersect the capacity surface, they do not cause excess capacity until such intersection precludes the establishment from selecting a point on the capacity surface which yields higher profit.

When demand restrictions are severe enough to cause actual output to be below the capacity function in at least one dimension, there is no obvious way in most circumstances to separate the amount of the excess associated with the levels of demand from that associated with unbalance. In the simple case of balanced capacity and demand restrictions which yield the same relative mix as that of the capacity optimum, the ratios of stocks utilized to total stocks in each process will be equal and, again assuming linearity, equal to the ratio of actual to capacity output for each and all products. But this is the only simple case. Even with balanced capacity, demand restrictions which cause the relative mix of output to be different from the balanced capacity mix will cause varying ratios of capital stock utilization in the several processes. The ratio of actual to capacity output will vary depending on the complex of demand restrictions and the assumptions made with respect to product mix [i.e., the direction used in moving from actual output to the capacity function]. When excess capacity—measured in terms of stocks—is caused jointly by demand restrictions and by an unbalanced capacity function, a precise separation of the two effects appears to be impossible.

At the level of the individual establishment, excess capacity which results from supply constraints parallels completely that caused by demand limitations. Nonetheless, supply restrictions do add to the complex of reasons for the existence of excess capacity and to the complications in segregating its causes.

#### CAPACITY OF AGGREGATES OF ESTABLISHMENTS

For purposes of capacity measurement, the best of possible worlds would be that in which all establishments were vertically integrated from the hire of factors of production through to the supplying of final demand. In such circumstances the restraints on output deriving from the stocks of capital would be conceptually simple to formulate. The "capacity" of the economy would be analogous to that of the establishment in (1), with the  $Y$  summed over all establishments with capital stocks which, actually or potentially, could be used to produce any good, with the  $m$  set increased to include all types of capital and



the  $n$  set increased to include all goods. The result is the same as the usual production possibility curve of economics, considering capital as the sole scarce productive factor and limited by linearity assumptions. Similarly, any number of establishments could be grouped on the basis of the types of goods they produce or the nature of their capital stocks to derive "industry" capacity functions.

Estimates of capacity derived from individual establishments would not yield the above type of aggregate, however. The principal reason is that neither capital stocks nor goods in the process of production are completely mobile among establishments. The excess capacity caused by unbalanced facilities within establishments would tend to disappear if stocks could be reallocated or if goods in the production process could be costlessly moved among establishments. While the market mechanism does operate to affect such adjustments over time, both capacity and excess capacity estimates based on ratios of stocks utilized to total stocks tend to underestimate the theoretical potential of the economy.

In this hypothetical world of fully integrated plants, it is only through such things as the possible "dovetailing" of unbalances that the stocks of one establishment interrelate with those in others. But as soon as the integration assumption is relaxed and intermediate production by separate establishments is permitted, interrelations among establishments must be considered for other reasons. The problem is that even if capacity is always balanced within establishments it may be unbalanced among them. The capacity of buying establishments may be redundant in terms of the supply restrictions imposed by the stocks of supplying establishments and vice versa. Aggregation of capacity measures based on establishment reports are not apt to reflect these interrelations and, hence, to overstate the possible total industrial capacity output.

Conceptually this type of interrelation can be accounted for by a combination of input-output analysis and linear programming. This analytic framework is extremely complicated, however, if detailed input-output coefficients for each product of multiproduct establishments are included and if heterogeneity among establishments precludes a rather massive grouping into "industries."

Finally, it should be noted that interrelations may exist with respect to other factors of production which several establishments demand in common. A factor which appears to exercise no restraint from the point of view of each establishment may be restrictive from the point of view of all of them. Again, a form of input-output analysis is necessary to handle this problem.

#### AREAS FOR CENSUS QUESTIONS

While measurement difficulties are indicated, the concept of capacity is itself operational, both at the establishment and "industry" or economy levels. The following appear to be relevant areas for census questions:

1. *The time-intensity of capital usage.*—In (1), the  $Y$  parameters depend on "normal" work schedules as well as on the size of capital stocks. At a given time, these schedules may be functions of demand restrictions or reflective of practices designed to overcome unbalances

in the facilities of the various processes. Capacity estimates should be based on the schedules which would be used if demand were redundant for all products, but with whatever degree of unbalance as actually exists. Capacity questions, then, should stipulate not the existing work schedules, but those that would be used with no demand restrictions and the present facilities.

2. *Capacity in output terms.*—With work schedules defined as above, and with the assumption that the existing relative output mix is retained and that there are neither demand nor supply restrictions, the ratio of current to maximum possible output could be ascertained. Maximum possible output is that at which the first facilities “bottle-neck” occurs.

3. *Capacity in terms of capital stock.*—The ratio of plant and equipment in use to total plant and equipment carried on the books could also be sought, but this poses severe measurement problems. If value measures are used, it must be decided whether depreciated or undepreciated values are the more appropriate, and in addition, methods will have to be developed to convert the reported values to constant dollar terms. If physical quantity measures are employed, methods will have to be developed to aggregate heterogeneous capital items.

It would be presumptive as well as impossible to attempt the resolution of capital stock measurement difficulties here. Work done in the last decade on the deflation to constant values of capital stock—illustrated by Daniel Creamer’s pioneering work at the National Bureau and at the Conference Board—suggests that pragmatic methods of deflation are available, at least for broad industry groups.

Whether depreciated or undepreciated values are preferable for capacity measures will depend in part on the purpose of the measurement. If the capital stock is to be valued in terms of the least cost alternative method for producing goods, the depreciated values seem the better. But while capital stocks depreciate in terms of alternative cost valuations with age, this is not necessarily because the older stock items produce physical output at a slower rate. Length of life does not typically reflect capital being used up—in the sense that it disappears—but rather that continually higher maintenance expenses are necessary to maintain its ability to produce.

If depreciated values are used, and if it may be assumed that newer capital which is less costly to operate and maintain tends to be kept in use and older, more costly capital to be shut down first, the ratio of depreciated value capital in use to total depreciated value capital in the establishment will tend to underestimate the relative amount of unemployed physical capital and to underestimate the amount by which physical output could be expanded with existing stocks. It may be argued, then, that the depreciated values are better if one wants the economic value of capital in use relative to the economic value of total capital, but that undepreciated values are better if one wishes to estimate via capital stock measures the amount by which gross output could be increased.

There is another possibility for measuring capital utilization rates through census reports. If the plant and equipment of an establishment can be subdivided into reasonably homogeneous items of physical capital corresponding to the major processes of the establishment, ratios of physical stock in use to total stock might be found for each.

These would be useful in themselves—particularly for estimating the extent to which transfers of capital among establishments might reduce the amount of unbalance in facilities—and could conceptually be aggregated into a ratio for the entire establishments with the use of value (depreciated or undepreciated?) weights.

4. *The degree of balance.*—With the caveats obvious from the above, a comparison of the actual to capacity output ratio with the ratio of stock in use to total stock should provide some indication of the extent to which unused facilities are due to unbalance. In view of the problems inherent in the capital ratios and since the two ratios may differ due to nonlinear production functions, it might also be asked what ratio would obtain between stocks in use and total stock at the maximum possible output as defined above. To estimate whether the existing mix is the cause of unbalance, questions could also be asked to determine whether some other mix would more fully utilize facilities. To check for redundant unbalance it could be asked whether some of the facilities would not be fully used regardless of mix.

5. *Supply restrictions.*—Questions could be asked to determine whether the ratio of actual to capacity output is the result of limited material or factor supplies. If supply restrictions appear, it might be asked whether these influence the mix as well as the level of output and what the ratio of actual to capacity output would be in the absence of supply restrictions.

6. *Demand restrictions.*—Questions similar to those for supply restrictions might be asked, but the answers are implied by previous answers to the supply and balance questions.

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APPENDIX I: PART H  
THE MEASUREMENT OF CAPITAL

By VERNON L. SMITH  
Purdue University

## THE MEASUREMENT OF CAPITAL

It is so easy to get one's fingers burnt trying to measure something called "capital," that only the incautious could be expected to accept the challenge of preparing a paper on this subject. Only a decade ago it was an article of faith among graduate students that capital theory was a "mess." But now that growth economics has become of commanding interest to the profession this attitude toward capital, its theory and measurement, seems to be disappearing. No matter how difficult may be the problems of dealing analytically and empirically with capital, everyone appears now to be convinced that it is important to try.

This paper will review the various methods for measuring capital that have found common acceptance in the literature. Each method measures a different aspect of capital, and each will be evaluated critically in terms of its ability to measure that concept of capital to which it is directed. In addition the paper proposes a supplementary measure of capital—value added on wealth account—based upon the net market value of establishments.

### I. WHAT IS CAPITAL?

To me the outstanding distinguishing characteristic of things to which the term "capital" applies, is just that their presence is required by or enhances the economic activities of production and sales, and this quality of being present is not normally altered to an important degree by these activities. There is no consumption of such capital inputs in any sense similar to the consumption of raw materials and energy. For this reason I have always considered the term "capital consumption" to be somewhat misleading. It is the feature of *not* being consumed that endows capital with its uniqueness. Economic efficiency may require capital to be displaced, but not consumed. Thus knowledge (usually classified as human capital), which cannot be consumed in any sense through use (and which may even have a tendency to expand with use), is more capital-like than the most durable tangible structures. There is an alternative concept of capital which is really a corollary to the "presence" concept, viz the idea of capital being anything that increases the owner's future stream of income receipts. But this is implied by the fact of being productive and not currently consumed.

These elementary considerations point inevitably to a stock as opposed to a flow concept of capital. If capital is to be measured meaningfully, it must be measured as a stock or inventory of things present during the process of production and sale. The term "services" is a useful word for describing what it is that a capital good supplies when it is present during production, but I do not believe as a general rule that the term has very much, if any, practical operational content for productivity analysis. For many types of capital, a measure of services

such as building-hours or pipeline-hours just doesn't seem very interesting. For other types of capital such as machines that rotate and move and turn out pieces, I can't see that machine-hours provide an independent measure of anything that is not fully measured when we list the quantities of raw materials, energy, and other current inputs consumed in the process of production. Capital is something that is there when production occurs, and the intensity of its utilization is accounted for by the rates at which current inputs are consumed in the process of producing at the resulting rate of output. Machine-hours provide only the crudest measure of this intensity of utilization since it is obvious that one machine can work "twice as hard" as another, but both record the same machine-hours. But one machine cannot work harder than another without consuming more energy and more raw material. The vector of current input consumption, in cooperation with capital, seems to me to fully account for any aspect of capital that one is tempted to measure with "machine-hours." Now it may be that at some level of aggregation, for some purposes, some students may wish to use something like "plant operating hours" as a surrogate for the other current inputs. If so, and if it doesn't cost too much I see no reason not to include the appropriate questions on the census forms. But I would not give it high priority.

In what follows, therefore, our attention will be directed to the measurement of capital as a stock. Specifically, and there appears to be no practical alternative to this, we will be concerned with the measurement of the value of capital stock. Values can, of course, be put in physical-like terms by deflating or redeflating for price changes. There are problems here which I hate to see swept under the rug, but the fact is that I have nothing to say about these index number problems, so I will remain silent on them.

## II. TRADITIONAL MEASURES OF THE VALUE OF CAPITAL STOCK

So far as I have been able to determine, all attempts by economists to measure the value of a stock of capital fall into one of the following three categories:

1. The gross (or undepreciated) stock, measured by cumulative investment expenditure adjusted for retirements and price changes.
2. The net (depreciated) stock measured by the current market value of the existing stock.
3. The discounted present value of the future expected net earnings attributable to the stock.

Our primary concern will be with the gross and net stock measures. All three of these measures of capital place a valuation on something of interest to economic analysis. The gross stock is the gross real cost of capital—the value of the goods and services foregone so that society might accumulate the wealth to which this measure applies. This measure is most often applied to tangible reproducible wealth, but in principle it might be extended to other forms of capital wealth. From estimated series on public and private spending for education and training, and expenditures for research and development, one could estimate the cost of the stock of knowledge (human and "organizational" capital).

The net stock measures the alternative resource value of the existing stock. Net stock is less than gross stock, because used capital goods command a smaller market value than new capital items. There are two reasons normally cited for this: (1) Deterioration—used capital goods may be less productive than new goods of the same technology, and, more important, (2) exhaustion of economic life. Used capital goods have fewer productive years available because of declining productivity and/or the rising threat of economic displacement due to technological improvements which cannot be embodied in existing hardware.

As between gross and net stock, if an either-or choice had to be made, I would choose the former. A minor reason is that, of the practical measures available, the data used to measure gross stock are better than those used to arrive at net stock. A more commanding reason is that I believe gross stock to be the most nearly relevant for productivity and production function analysis, and it is this type of analysis for which capital data are most likely to be employed. Fundamentally, if what makes capital capital is the quality of being present when the activity of production occurs, then gross stock is the significant variable for productivity analysis. This view has a reasonably strong empirical foundation in the studies that have been made of engineering production functions involving capital goods. Some additional support for this view is provided by Barna from his sample survey studies:

\* \* \* there are two concepts of replacement cost: replacement cost new, and written-down replacement cost. The second concept corresponds to the value of capital in economic theory, but the first may be equally important in a study of productive relationships \* \* \* value declines faster than efficiency, and indeed for important classes of assets efficiency does not decline at all. For this reason the relationship between replacement cost new and output may be more stable than between written-down replacement cost and output, and the first concept is more relevant in forecasting incremental requirements of capital [1, p. 80].

\* \* \* after a decision is taken to scrap, the asset is run down through lack of maintenance though in some industries maintenance has to be kept up to the end. Buildings are generally kept, through repair and modernization, in a condition which makes them comparable to new buildings of the same type [1, p. 90].

My preference for gross over net stock is the product of interests biased in the direction of productivity analysis. But if one is interested in a number which measures the alternative resource value of a region's, industry's or nation's accumulated capital stock, then net stock is appropriate.

In at least one respect the productivity argument for gross rather than net stock should be qualified. There is actually a third reason, not mentioned above, for gross and net stocks to differ. Investment expenditures are probably never precisely realized. Especially in the case of new experimental types of capital goods, the expenditures may produce forms of capital wealth considerably more, or less, productive than anticipated. The result may lead to a substantial capital gain on the initially produced goods, until their production can be adequately expanded. Or, where the assets turn out to be less productive than expected, capital values may decline sharply. In either case, I can readily appreciate that for such capital goods, net stock might be superior to gross stock for productivity studies.

The most important application of discounted present value measures has been to the category, human capital [8, 10]. This is not surprising, since this particular asset does not have a recognized market, new, used, or scrap. The hazard here is obvious from the discount formula

$$V = \sum_{t=1}^{\infty} \frac{E(R_t)}{(1+r)^t},$$

where  $r$  is the discount rate,  $E(R_t)$  is the expected earnings of the capital asset in period  $t$ , and  $V$  is the asset's present value. To compute  $V$ , we have to estimate  $E(R_t)$ ,  $t=1,2, \dots$ , and choose an  $r$ . This introduces large potential errors of estimation.

### 1. GROSS VALUE OF TANGIBLE CAPITAL STOCK

I find in the literature two feasible alternatives for measuring gross stock. One is the use of fire insurance and similar appraisal valuations; the other is the perpetual inventory method.

How practical it would be to obtain survey information on fire insurance valuations on a grand scale, I am not competent to say. R. W. Goldsmith has noted that this is a time honored method, having been used in Germany as early as 1913 [7, p. 329]. He has further stated the opinion that such valuations are not generally enough available to produce aggregate figures based upon them [7, p. 329]. Barna reports success in obtaining information on such valuations in the United Kingdom [1, pp. 79, 80], and argues persuasively in their favor over the use of book values.

In the absence of comprehensive, continuing official estimates of U.S. wealth by the Federal Government, R. W. Goldsmith and his associates of the National Bureau of Economic Research have prepared data on the value of tangible assets from 1896 to 1958 [4, 5]. These important series have provided measures of the value of tangible capital using what Goldsmith has called "the perpetual inventory method." By this method estimates of the stock of each type of reproducible tangible asset are obtained by cumulating the capital expenditures on that asset for a period of years equal to the asset's assumed life.

Under the one-horse-shay assumption that the  $i$ th type of capital has a fixed life  $L_i$ , this is equivalent to cumulating all previous capital expenditures less retirements. Thus if  $E_i(t)$  is total investment expenditures on  $i$  in year  $t$ , and  $R_i(t)$  represents that part of total expenditure which "replaces" capital assets that are retired in year  $t$ , then the gross stock of  $i$  at some point of time  $T$ , can be defined

$$(3.1) \quad G_i(T) = \sum_{t=1}^T [E_i(t) - R_i(t)].$$

Under the one-horse-shay assumption  $R_i(t) = E_i(t - L_i)$ . Since (initially) we must have  $R_i(t) = E_i(t - L_i) = 0$ ,  $1 \leq t \leq L_i$ , the expression can be written

$$(3.2) \quad \begin{aligned} G_i(T) &= \sum_{t=1}^T [E_i(t) - E_i(t - L_i)] = \sum_{t=1}^T E_i(t) - \sum_{t=L_i+1}^T E_i(t - L_i) \\ &= \sum_{t=L_i+1}^T E_i(t) \end{aligned}$$



The Goldsmith approach is based upon the simplifying (and perhaps necessary) assumption that assets behave as if they had zero mortality up to their expected life, and then abruptly died. In fact the asset lives are obtained from Bulletin F estimates of "useful lives." A clear distinction should be made between the measure that we should like to obtain ideally, and that which necessity, or cost, has driven us to accept.

Ideally, if  $F_i(t)$  is the survival rate of assets of age  $t$ , and  $M_i$  is the maximum life of assets of type  $i$ , then the  $i$ th gross capital in year  $T$  can be expressed

$$(3.3) \quad G_i(T) = \sum_{t=0}^{M_i-1} E_i(T-t)F_i(t).$$

Under the assumption that  $F_i(t)=1$ ,  $0 \leq t < M_i=L_i$ , this becomes

$$(3.4) \quad G_i(T) = \sum_{t=0}^{L_i-1} E_i(T-t),$$

which is equivalent to (3.2).

Barna [1, pp. 85-89, 92] has criticized the assumption, or approximation, underlying this method, viz that all facilities die at fixed ages. Barna's direct sample study of asset mortality in British manufacturing suggests a linear declining survival curve in contrast to the rectangular curve that leads to (3.4). If these findings are generally characteristic of the mortality behavior of capital assets, then one

should assume the linear approximation  $F_i(t) = 1 - \frac{t}{2L_i}$ , where  $M_i = 2L_i$ ,

and  $L_i$  is the average life of asset  $i$ . Instead of (3.4), the estimating equation would be

$$(3.5) \quad G_i(T) = \sum_{t=0}^{2L_i} E_i(T-t) \left[ 1 - \frac{t}{2L_i} \right] = \sum_{t=0}^{2L_i} E_i(T-t) - \frac{1}{2L_i} \sum_{t=0}^{2L_i} t E_i(T-t)$$

Barna compares his direct estimate of  $G_i(T)$  for British manufacturing in 1955 with the corresponding perpetual inventory estimates of P. Redfern. He concludes that about one-half of the 50-percent larger figure that he obtains is attributable to the mortality assumptions underlying the perpetual inventory method.

If Barna's findings are generally applicable to all capital assets, then an estimating equation such as (3.5) would be expected to provide somewhat improved estimates of  $G_i(T)$ . In any case, for purposes of a proposed inventory of national wealth to be undertaken by the Federal Government, such studies point to the importance of setting up procedures for gathering comprehensive data on the mortality of capital assets.

## 2. NET VALUE OF TANGIBLE CAPITAL STOCK

The obvious way of determining the value of net stock is from the market prices of new and used structures and equipment. But such information is likely to be available only for specialized types of capital goods, such as transport equipment (trucks, trailers, airplanes, etc.), farm machinery, and perhaps general purpose machine tools

and prime movers. Wherever possible such data should be collected, since it is the theoretically relevant measure of net stock. If net stock values could be compiled from price data, even for only limited types of hardware, it would make possible comparisons with net stock values, for the same sample of capital, obtained from book values or gross value (expenditure) adjusted for "depreciation."

The most common method of estimating net stock is from book values. A major deficiency in such data is that they tend to reflect depreciation rates that maximize after tax profits and such rates may bear little or no relationship to declines in asset market value. It is likely that many capital assets have economic lives in excess of the minimum writeoff periods allowed under the tax laws. But even without the tax law effect, business depreciation policies tend to be highly variable and arbitrary.

Studies by Stigler [8], Creamer, Dobrovolsky, and Borenstein [2], and others, usually rely upon book values compiled from corporate tax reports of the Internal Revenue Service and reported in "Statistics of Income" (or the "Source Book"), or from the census of manufacturers. Thus, Creamer, Dobrovolsky, and Borenstein use the census definition of invested capital, viz., fixed capital, composed of land, buildings, machinery, and equipment, and working capital, made up of cash, inventories, and accounts receivable [2, p. 12]. This corresponds to the definition in "Statistics of Income," except that intangibles like patents and goodwill are included in the latter [2, p. 12]. I do not think these definitions are suitable for measuring the real capital stock either tangible or intangible. If one wants to measure the stock of tangible reproducible capital wealth, then financial assets such as cash and accounts receivable should be excluded. If one wants to measure the stock of capital including intangibles, the use of book values for intangibles such as patents and goodwill is even more unreliable than the book values of depreciated property. For reporting purposes, corporations tend to be exceedingly conservative in assigning values to intangible assets.

The third method of estimating net stock is by application of depreciation rule adjustments to gross expenditures on capital assets. Thus Goldsmith [5, p. 85] estimates net stock from gross values on the assumption of constant straight line rates of depreciation for each type of asset. The resulting estimates provide series which are arrived at independently of the estimates obtained from Internal Revenue Service book values. As might be expected, Goldsmith's estimates of gross stock correspond closely to the IRS estimates, the former being consistently above the latter. The difference never exceeds 7 percent in any of the postwar years, 1945-57 [5, p. 84]. On the other hand, the perpetual inventory estimates of net stock vary from 7.5 percent below to over 6 percent above the corresponding IRS figures [5, p. 85].

### III. CRITIQUE OF TRADITIONAL MEASURES

As we have indicated, each of the above measures of tangible capital has a distinct value. However, I do not believe that they provide, by themselves, the most comprehensive set of measures that it is feasible and desirable to make available. In particular, the net stock measure contains conceptual deficiencies, which it will be my purpose

to attempt to correct by proposing a supplementary measure of net wealth.

Even if we had active markets for all classes of capital equipment and structures, and complete information on their new and used transfer prices, I would doubt whether the value of tangible capital could be adequately measured by a simple summation of component prices. For one thing, most capital goods are highly indivisible resources, once the planning stage has been passed and individual units of hardware of fixed sizes and configurations have been constructed and installed. When such capital goods are initially installed we would assume, theoretically, that the amount of capital (size of equipment, etc.) was adjusted until marginal value product and price were equal. Thus, internal value was identical with external value. However, conditions change and are almost certain to change over the life of highly durable capital goods. This does not mean that the firm continuously adjusts its capital equipment so that equality between internal and external values are maintained. In theory the firm retains any sunk investment whose contribution to the present worth of the firm is not below its going resale price. Consequently, the productive value of capital goods to a firm may be greater than their market prices. If the discrepancy is great enough, parallel production units may be installed, but this tends to occur at infrequent intervals in discrete lumps as when a new plant is added.

There is another, and, I think, more important reason why the market value of components may not sum to the productive value of an aggregate of capital employed by a firm. In modern productive organizations, capital assets tend to be installed as parts of man-machine systems whose agglomeration value may substantially exceed component value. Planning and design go into the system and these elements may add important capital values of their own. Systems must then be organized effectively for day-to-day operation under dynamic load conditions, and in environments requiring important decisions to be made almost continuously under uncertainty. The operating organization, together with the individual assets, and the planning and design infused into the system, represent an organic whole and a capital value jointly determined. The value of organizations, both in operations and in long-term planning are entirely left out of any measure confined to component tangible capital. Similarly, no account is taken of the research and development activities of firms, whose employment of hardware assets may account for a small fraction of the capital wealth, in terms of expected future earning power, that is actually represented. The knowledge of technology industries—electronics, drugs, space exploration systems, etc.—are, I suspect, drastically undervalued by measures based upon tangible wealth. Service organizations such as management, science, and engineering consulting firms would appear with negligible capital values. Finally, the contribution of the monetary and credit system to real productive wealth by facilitating finance and exchange, is undervalued by any measure looking only at fixed real assets such as bank premises.

For all these reasons the reviewed measures of tangible capital do not provide a precise wealth account parallel to the measures now available on income account. What is needed, or so it seems to me, is a measure of wealth added (at market prices) by individual decisionmaking (pro-

ducers') organizations, that corresponds with the value added on income account by such organizations. The former measure, by appropriate summation over establishments, would permit estimates of aggregate real productive wealth by sector, region, or national coverage, to complement present estimates of aggregate income based on value added by industry. Since value added by industry is due to capital *and* labor, the two concepts are not exact parallels. If we were to subtract from value added, all payments to households for labor, the resulting "net cash flow" of the industry would be the current account parallel of my "value added on wealth account."

A measure of value added on wealth account, at market prices that are determined under rather highly (if not perfectly) competitive conditions, is in fact available for a broad area of the economy. I refer to the securities markets in which the claims on going corporate enterprises are bought and sold in divisible units, with the result that valuations are placed continuously upon organizations as a whole at the margin. The valuations, so obtained, represent the market's opinion as to the present worth of the future expected earnings stream that will be derived from an individual organization's productive activity. It seems to me this is precisely the opinion we want. Such valuations change continuously, and sometimes drastically, but this is in the nature of the entity we are trying to measure. Expectations change; and the result is and should be reflected immediately in the valuations generated by the market for claims on corporations. Furthermore, this method of estimating present worth does not require direct estimates of future expected earnings, nor of a suitable discount rate.

It is clear that such a measure departs from the view that capital is productive means, separable from human beings and knowledge, and separately marketable. But the fact that human beings and the knowledge and skills embodied in them, are not marketable should not lead one to suppose that they fail to contribute something to organizations that is indeed capital-like. If our measure of capital is to account for a sector's or firm's value added net of payments for labor, then the productive contribution of all the intangibles that fall under the heading of "organizational capital" must not be arbitrarily excluded.

#### IV. A SUPPLEMENTARY MEASURE OF CAPITAL-VALUE ADDED ON WEALTH ACCOUNT

##### 1. DEFINITIONS OF GROSS AND NET WEALTH ADDED

All of the various methods of measuring the gross or net stock of capital involve entries on the asset side of the balance sheet. Where book values are used, such entries are used directly for estimating purposes. Where market values are used, one is concerned with attaching market prices to items that appear on the asset side of the ledger.

My proposed measure of capital is obtained by associating market prices with all items appearing on the liability side of the ledger and with the purely financial entries on the asset side. For a given establishment, I would define its gross value added on wealth account, or simply gross wealth added, as the market value of all claims on that establishment—notes outstanding, bonds, preferred stocks, common



## 2. SOME DIFFICULTIES

All of the traditional measures of capital are confronted by practical difficulties, and the wealth added measure is no exception. In my present inadequate state of knowledge on the matter, I would conjecture that these difficulties are no more severe for wealth added than for gross or net stock. Nevertheless they should be faced. The following provides a list which does not pretend to be exhaustive:

(1) Not all the claims on a corporation are traded.

Claims such as accounts payable would seem to present no difficulty. These represent obligations for goods and services received, which, we may assume are carried on the books at the market prices of such individual goods and services. Short-term notes and certificates of indebtedness would also presumably have market values very close to their book values. Where the firm has bonds and stocks outstanding which are closely held, and no quotations are available either on organized exchanges or over the counter, then wealth added cannot be determined by our method. In such cases the measure might be estimated by (i) assuming that the ratio of wealth added to cash flow for such firms is the same as for firms in the same industries where securities are traded, or by application of average price-earnings ratios for the industry; (ii) using an appropriate regression equation for estimating value as a function of such variables as earnings, cash flow, dividends, the firm's growth rate, and so on.

(2) Not all establishments are incorporated.

This presents the same estimating problem as (1). The only way out, it would appear, is to impute wealth to such establishments on the basis of cash flow, earnings, or regression methods.

(3) What about corporations with foreign operations?

I don't see how to get around this one neatly. The market value of, for example, American oil companies with large foreign holdings, will clearly reflect such holdings, but such market values cannot be wholly credited to net U.S. wealth. Such values are part of net wealth controlled by U.S. nationals, and this is perhaps of some interest. Adjustments might be possible, but they are likely to be very rough, though I suspect no rougher than the methods used to adjust gross stock to get net stock, or to estimate average life by type of asset.

(4) Is the "true" capital value of a company on a given date "correctly" determined by the securities markets, especially if those securities are under heavy buying (selling) pressure or wide speculative moves?

I list this as one of the objections to our measure, because many will perceive it as such. To me the fact that some corporation's securities may be subject to sudden wide moves is not an objection, but a truth about wealth which should be fully embodied in at least one of our measures of that illusive entity we call capital. In my private opinion many securities may not be worth their going exchange prices. But the simple hard fact seems to be that a thing is worth what you can get for it. We accept market prices in arriving at value added on current account. Yet the same objections could be raised. What

about speculative swings in the prices of sugar and soybeans? What is the true value of wheat, corn, and cotton when their prices are artificially supported? We value these things at their transaction prices, and I would do the same with claims on wealth. There are indeed monopoly and artificial support elements in many valuations. But these elements produce inefficiencies and resource misallocations which, theoretically, have an adverse net effect on society's income stream. This effect should be reflected in our measures of net income, *and* of net wealth. Market prices accomplish this at least as well as any substitute I can think of.

### 3. SOME EXAMPLES

Perhaps the best way to obtain an understanding of some of the implications of wealth added as a measure of capital is to compute it, compare it with other measures, and see what scientific sense it makes. To this end I have applied the measure to a selection of firms, engaged in widely differing activities, for the purpose of illuminating some interesting and controversial issues. In all cases the source was Moody's Industrial Manual or Moody's Bank and Finance Manual.

Table 1 computes wealth added for General Motors, 1961. The source of valuation, book or market, is shown in parentheses for each entry. Most entries are taken at book value in these calculations. In more sophisticated computations some of these items could be adjusted where data permits. For example, accounts receivable could be adjusted for bad debts by application of a default rate discount, Government securities could be valued at market where the maturity structure of the company's holdings is known, and similarly for such items as miscellaneous investments. Such sophistication would seem to be hair splitting in the General Motors case, since the adjustments would be slight, and the items involved are not a large proportion of net wealth added. But such need not be the case for all companies. For convenience of illustration, stock and bond prices were taken as the average of their high and low values for the year. Normally, one would apply quotations as of a given date. For General Motors we see that net wealth is about \$12½ billion. In the absence of the resources needed to build up direct measures of gross and net tangible and/or intangible property, I have provided the book value of net real (nonfinancial) assets (net property, patents, goodwill, and inventories) for comparison purposes (about \$4.9 billion). It will be no surprise that in the case of a strong, growing, blue-chip company, net productive wealth is over twice the depreciated value of physical structures, equipment and inventories, plus the modest accounting values typically imputed to intangibles like patents and goodwill.

As of 1961 the Syntex Corp. (table 2) was primarily a pharmaceutical research organization. It provides a rather extreme example of an organization whose market value is determined almost exclusively by the kind of organizational capital associated with research and development activities. In this instance, net wealth added is over eight times book net asset value.

TABLE 1.—*General Motors, 1961*

[Millions of dollars]

A. Calculation of gross wealth added :	
1. Total current liabilities (book)-----	1,425
2. Foreign subsidiary debt (book)-----	144
3. Employee benefit plans reserve (book)-----	26
4. Credits under stock option plan (book)-----	22
5. Miscellaneous liabilities (book)-----	241
6. Miscellaneous reserves (book)-----	25
7. General foreign reserve (book)-----	142
8. Debentures $3\frac{1}{4}$ , 1979, $V=221,322,000 \times 0.89\frac{3}{16}$ (market value)-----	197
9. Preferred stock, \$5, $V=1,835,644 \times 107\frac{1}{4}$ (market value)---	197
10. Preferred stock, \$3.75, $V=1,000,000 \times 83$ (market value)---	83
11. Common stock, $V=285,563,322 \times 49\frac{9}{16}$ (market value)-----	14,001
Gross wealth added-----	<u>16,503</u>
B. Calculation of claims on other establishments :	
1. Cash (book)-----	405
2. Government securities (book)-----	1,291
3. Accounts and notes receivable (book)-----	987
4. Subsidiary companies not consolidated (book)-----	433
5. Other security investments and miscellaneous (book)-----	18
6. Loans and advances to, and stock of steel suppliers (book)---	32
7. Treasury stock, $V=1,986,539 \times 49\frac{9}{16}$ (market value)-----	98
8. Prepayments and deferred charges (book)-----	73
Total claims on other establishments-----	<u>3,337</u>
Net wealth added-----	<u>13,166</u>
Net property, patents, goodwill (book)-----	3,092
Inventories (book)-----	1,800
Net real assets (book)-----	<u>4,892</u>

TABLE 2.—*Syntex Corp., 1961*

[Thousands of dollars]

A. Calculation of gross wealth added :	
1. Total current liabilities (book)-----	1,376
2. 6 percent convertible preferred (convertible at 10 common for each share of preferred. Shares not traded. Price assumed to be $10 \times$ common price= $357.5$ ). $V=4,601 \times 357.5$ (estimated market value)-----	1,645
3. Common stock, $V=1,430,470 \times 35\frac{3}{4}$ (market value)-----	51,139
Gross wealth added-----	<u>54,160</u>
B. Calculation of claims on other establishments :	
1. Cash (book)-----	847
2. Marketable securities (book)-----	36
3. Accounts receivable (book)-----	2,263
4. Prepayments (book)-----	101
5. Deferred charges (book)-----	775
Total claims on other establishments-----	<u>4,022</u>
Net wealth added-----	<u>50,138</u>
Net property, patents, goodwill (book)-----	2,563
Inventories (book)-----	3,677
Net real assets (book)-----	<u>6,240</u>



When applied to establishments with natural resources holdings such as timber, oil, and coal, our measure of capital includes the wealth attributable to such exhaustible capital resources. Table 3 shows the net wealth added by the Standard Oil Co. of Indiana to be about \$1.9 billion. But net real assets have a book value of nearly \$2.4 billion not counting the company's reserves of crude oil and natural gas. If we include the value of estimated crude oil reserves at \$1 per barrel (less than a third of the going price), real assets have a paper value of \$2.6 billion. There are two reasons for this very large discrepancy between the paper value of real assets and the market value of the company's productive wealth: (i) the market is not so naive as to impute a value as high as even \$1 per barrel of oil still in the ground, and for which there may be little use for 25 to 50 years. Within that time, oil might become obsolete as a major source of energy. Consequently, the market discounts very sharply the value of oil (and gas) reserves; (ii) the oil industry in 1961 was experiencing depressed equity values, and severe price weakness, due to oversupplies. One result has, of course, been a decrease in drilling activity—a response to be expected when the market signals a decline in the present worth of future earnings.

Table 4 summarizes the results of the computation of net wealth added for a bank (First National City Bank of New York), a holding company (Mission Development Co. which directly controls Tidewater Oil through ownership of about one-half of Tidewater common), and an investment company, American Research & Development).

TABLE 3.—*Standard Oil of Indiana, 1961*

[Thousands of dollars]

A. Calculation of gross wealth added:	
1. Total current liabilities (book)-----	263, 584
2. Notes, subsidiary debentures, miscellaneous obligations (book)-----	206, 523
3. Bonds, 3½s, 1982, V=13,961,900×1.14% (market)-----	16, 021
4. Bonds, 4½s, 1983, V=200,000,000×1.01% (market)-----	203, 250
5. Minority interest (book)-----	2, 108
6. Common stock, V=35,784,220×51 (market)-----	1, 824, 995
Gross wealth added-----	<u>2, 516, 481</u>
B. Calculation of claims on other establishments:	
1. Cash (book)-----	133, 024
2. Marketable securities (book)-----	111, 318
3. Accounts and notes receivable (book)-----	285, 035
4. Prepaid items (book)-----	9, 497
5. Holdings in Standard Oil Co. of New Jersey (market)-----	80, 724
Total claims on other establishments-----	<u>619, 598</u>
Net wealth added-----	<u>1, 896, 883</u>
Net property (book)-----	2, 136, 922
Inventories (book)-----	225, 635
Net real assets (book)-----	2, 362, 557
Value of crude reserves 2,618,000,000 barrels×\$1 (estimated market value)-----	2, 618, 000
Net real assets including reserves-----	<u>4, 980, 557</u>

TABLE 4.—*First National City Bank of New York, Mission Development Co., and American Research and Development, 1961*

[Thousands of dollars]

Company	Year	Gross wealth added	Net wealth added	Net real assets (net property, patents, goodwill, inventories)
First National City Bank of New York.....	1961	9,888,750	473,500	115,793
Mission Development Co.....	1961	128,395	-38,302	0
American Research & Development.....	1961	39,565	2,477	0

As you would expect for a bank, net wealth added is a very small portion of gross (about 5 percent), but substantially above net real assets (bank premises). A holding company is included, because the equity claims on such institutions typically sell at a discount on the order of some 30 percent below the market value of their holdings in operating companies. In the case of Mission Development, net wealth added is a negative \$38 million. Hence, by our measure of wealth, an operating company would contribute a smaller net capital value if it were controlled through a holding company. Why is this? And should our measure of wealth contain this discount? Views will differ, but I would tend to take such results at their face value. Apparently the market is saying that a negative capital value should be imputed to any institution whose sole or primary purpose is to concentrate managerial control and prevent that control from being effectively challenged. The result is to reduce the value of the "organizational capital" contained in the operating-holding company system. If this interpretation is correct, then net wealth added should reflect these discounts.

The same phenomena occur in applying the measure to investment companies. Our example, American Research & Development Co., shows a positive net wealth added, but many investment companies may show a negative value. American Research & Development has a reputation for finding small new companies that need capital, and that turn out to be winners. If this is true, I would think such skills should command a positive capital value. On the other hand, investment companies who can demonstrate no such skills would appear to make zero or negative net contributions to wealth.

#### 4. CONCLUDING REMARKS

What is provided by net wealth added, as a measure of capital, which might be of use in economic analysis, and which is not reflected in the traditional measures of gross and net stock? Fundamentally, it provides a measure of expectations about future earnings. These expectations are supported by the perceived earning power of a firm's or industry's capital in the widest sense of the term. Capital in this sense includes tangible reproducible wealth and organizational capital in the form of knowledge, research productivity, and administrative systems. Theoretically, these expectations are an important determinant of present or near term investment behavior. Net stock figures, particularly if supplemented by cumulative outlays for research and development and training, provide depreciated measures

of capital input. If net wealth added by any industry exceeds net stock, it means that the expected rate of return on investment in that industry exceeds the market rate of interest. That is, net wealth added at  $t$ ,  $W(t)$ , is the discounted value of future net earnings  $n(x)$ ,  $t \leq x \leq \infty$ :

$$W(t) = \int_t^{\infty} n(x) e^{r(t-x)} dx.$$

But the rate of return,  $\rho$ , on the present net stock  $N(t)$ , which is implied by the earnings stream  $n(x)$ , is given by

$$N(t) = \int_t^{\infty} n(x) e^{\rho(t-x)} dx.$$

Therefore, if  $W(t) > N(t)$ , then  $\rho > r$ , and one would expect investment to expand. Similarly if  $W(t) < N(t)$ ,  $\rho < r$  and investment should contract.

Grunfeld's paper [6] is the only study of which I am aware that uses a concept resembling net wealth added as an expectations variable in explaining corporate investment behavior. For this purpose, Grunfeld uses the "market value of the firm," defined as the market value of outstanding shares and debt where the latter is approximated by book values [6, pp. 224-227]. If all debt both short and long term are included, this corresponds to what I have called gross wealth added. I would consider net rather than gross wealth to be the superior expectations variable in accounting for *nonfinancial* corporate investment outlays. Of course, market expectations need not correspond to those of corporate decisionmakers, but it seems unlikely that the two groups could have widely differing expectations for extended periods of time. In any case Grunfeld finds his measure, the "market value of the firm," to be superior to either current or lagged profits in explaining investment behavior. This provides some evidence to suggest that net wealth added may be an important measure of expectations and that data on such a concept of capital should be compiled along with series on gross and net capital stock.

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COMMENTS ON PROFESSOR SMITH'S PAPER

By Edward F. Denison

The paper we just heard summarized by Professor Smith was not only interesting but provocative; it certainly raises some new matters. I shall discuss it in three parts.

On the first section, "What Is Capital," I shall say only a few words. Professor Smith feels that measures of the use of capital are of low priority and have little value. I am not so sure this judgment is correct. Smith assumes there is a constant ratio between machine-hours and either power consumption or raw material consumption so that the latter can serve as proxies for the former. Even if this were true, it would not permit aggregation of different types of machines. But there are also questions of changing efficiency in the use of machinery and of power or materials, a subject that probably deserves more attention that it has received. The article by Murray F. Foss in the June 1963, "Survey of Current Business" is an example of the careful use of electric power consumption to try to derive indirectly a measure of the use of machinery. Foss clearly does not conclude that direct data for machinery utilization is unnecessary. In any case I suspect there is considerably less than general agreement that data on capital utilization are not needed. The question is incidental to the main issue of the day, the valuation of capital, so I will just drop it here.

Let me now jump to the latter part of the paper, which offers a proposal for measuring the market value of corporations as going concerns. By some adaptation of the technique one could perhaps add noncorporate enterprise, but if he wanted to obtain a national wealth total he would presumably have to use other techniques to get at non-enterprise values.

Professor Smith's discussion should make it quite clear that this is at best a supplementary measure of wealth. It could not replace valuation of capital goods as the heart of a wealth study for a number of reasons, of which two are central. First, it provides no way of getting at any kind of breakdown of tangible capital by type of assets, a classification that is of great interest. Nor does it lend itself to the obtaining of information on age distribution or other characteristics of tangible capital assets. Second, if one were to compile the value of going-concern estimates on successive dates, it appears that there would be no way to deflate them. Hence one would know nothing about changes over time in the real value of the capital stock, with or without inclusion of intangibles.

As I see it, Smith's proposed wealth measure is the capital counterpart to nonlabor income in the corporate sector of national income. Corporate national income can be divided between compensation of employees (I think this would be the correct term, rather than Smith's term "labor payments to households") and a residual consisting of net interest, rents, royalties, and corporate profits. The market value of the asset counterpart of this nonlabor income is the object of Smith's interest. Since the nonlabor income component is a number I have used myself, this approach holds a certain inherent attraction for me. However, we must ask what we could do with such data if we had them.

An unduplicated asset value aggregate of this type lends itself only to certain breakdowns, viz., those for which the enterprise is an appropriate unit of classification: (a) industry of major activity of the enterprise; (b) size of enterprise; and, if the coverage is greater than corporations, (c) legal form of organization.

We already have such distributions of nonlabor income for corporations. Percentage distributions of asset values of corporations presumably would differ from similar distributions of nonlabor income for two main reasons. First, the market might not like the way profits are measured and appraise current profits as something different from what appears on the books, or even on the books as adjusted by the National Income Division. Second, as Professor Smith points out, they might differ because of the expectation that the future profits distribution is going to differ from the present one. Before one puts many resources into this undertaking, he might ask whether this evaluation is really what he wants, whether he could interpret the difference between this distribution and a distribution of property income if he had it, and, if so, whether it is really worth the cost. That the answers are affirmative is not obvious.

One use of income share data is in the derivation of production functions to analyze sources of economic growth. This use encounters the problem that what we call nonlabor or property income is a combination of the earnings of tangible capital, of intangible capital, and of land, together with pure profit, including the results of uncertainty and of monopoly positions of all sorts. Use of the nonlabor share as if it were a return only to real capital overstates the rate of return on real capital and leads to overstatement, possibly a gross overstatement of the contribution of capital to economic growth. Professor Smith properly stresses the things other than the real capital owned that affect income and hence the value of a going concern. If one could divide Smith's capital values of concerns between the value of real

reproducible capital and land, and the capitalized value of intangibles and expected pure profit, this would (assuming some kind of equalization of returns) give a measure of the fraction of nonlabor income that is really a return to tangibles. Presumably this would require comparing Smith's proposed values with independent but consistent data for the value of tangibles. Whether there is any promise that this might be possible I put as a question.

In short, my general reaction is that this is an interesting proposal which ought to be explored further. Its use would be as a supplementary estimate which might be prepared inexpensively. It could not be the primary effort in the wealth survey.

I turn now to Professor Smith's classification of valuation procedures used in more conventional measures of the value of capital. I would approach the classification a little differently. It seems to me that there are three basic distinctions that must be made. There are certainly a great many more distinctions, but these three seem fundamental.

The first distinction is the obvious one between gross stock and net stock.

The second, the distinction I have drawn elsewhere,<sup>1</sup> goes to the heart of the problem of valuing depreciable assets. By almost any approach the value of a capital good newly produced and sold today is the price at which it is sold. The problem is to value the many older assets which are still in use but not produced today. In general, there are two reasonable, but fundamentally different, ways to equate their value with those of newly produced goods. (For this distinction I ignore physical exhaustion of used capital goods.) One is to equate old capital goods with the new goods in terms of what both would cost to produce at the same date, presumably the present date. The second is to try to equate goods produced at an earlier date with new goods by their relative abilities to contribute to production at the present date. For brevity, let me call the first way "values equated by cost," and the second "values equated by productivity." The first value exceeds the second because of obsolescence.

The third distinction refers to the methods of arriving at the valuation. These also fall loosely into two types. One, which I shall call the price index method, is to find the original cost of the assets and bring it up to the present by the use of price indexes.<sup>2</sup> The other is to attempt to get a present market value of the asset more directly by any of several procedures. If the asset actually is sold, one finds out the price. Or one obtains an imputed value based on sales prices of similar assets. Or one obtains an appraisal. Or one secures fire insurance valuations. Let me call all of these direct valuation. I am not suggesting that in fact one can really solve the whole national wealth estimation problem by these techniques, but one could go a certain distance.

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<sup>1</sup> Edward F. Denison, "Theoretical Aspects of Quality Change, Capital Consumption, and Net Capital Formation," in "Problems of Capital Formation," vol. 19, "Studies in Income and Wealth," New York, National Bureau of Economic Research, 1957, pp. 215-284.

<sup>2</sup> This is the valuation procedure used in the perpetual inventory method, but the perpetual inventory method also implies a particular approach to determining what capital goods are in the stock and hence must be valued.

These three distinctions would give eight combinations for wealth estimates if all combinations were possible, but I think that in reality there are at the most only four.

Consider first the use of direct valuations based on sales prices, or on insurance valuations or appraisals in lieu of them. I would think that this is possible only for net stock estimates since only goods as they actually exist can be sold. You do not ordinarily get a valuation of an unused 1950 automobile in 1962 except, perhaps, as a curiosity. Thus this approach is not available for estimation of gross stock. Professor Smith classifies fire insurance valuation under gross rather than net stock estimates, but this appears to be wrong.

Next, direct estimates of the present market price of assets must, in principle, be estimates of the type where value is equated by productivity, rather than by cost, because the current price must reflect what an older capital good can contribute to production now, relative to a new good, rather than by what it would cost to produce.

Finally, the price index method lends itself to either a gross or net stock estimate. In the case of the gross stock, it lends itself only to estimates of the type where value is equated by cost, not by productivity. This is determined by the characteristics of price indexes available for deflation. In the case of the net stock it leads to estimates where value is equated by cost if the depreciation patterns applied to capital goods reflect only physical deterioration without regard to obsolescence. It leads to estimates where value is equated by productivity if the depreciation patterns used reflect obsolescence as well as physical factors.

So only four possibilities, not eight, remain from this classification. These are direct estimates of the net stock, with value equated by productivity; price index estimates of gross stock with value equated by cost; price index estimates of net stock with value equated by cost; and price index estimates of net stock with value equated by productivity. I am not stating that it is in fact possible to obtain accurate estimates of these types but only that these are the only possibilities that seem to me available for examination.

If a wealth survey is to be undertaken, it ought to yield better estimates of the capital stock than we can prepare now, in addition to providing new detail. Some of the questions I would raise about a wealth survey are these: First, can we in fact get enough relevant data to make a comprehensive and reasonably accurate direct estimate of the net stock with value equated by productivity? Second, can we obtain information on what actually is in the stock better than the quantities used in the perpetual inventory method, so as to be able to improve on existing estimates using the price index method? Third, what can we learn about service lives and depreciation patterns that would enable us to get estimates of the net stock by the price index method that correspond more exactly to either or both of the cost and productivity valuations?

Let me simply end up with one small footnote. It is essential to balance what we would like to have with what there is some reasonable hope of obtaining. We have to think about both throughout the inquiry.

## (SUPPLEMENTAL PAPER)

## MEASUREMENT OF NATURAL RESOURCES WEALTH

By W. Hochwald and H. J. Barnett

## I. WEALTH ACCOUNTS AND OTHER SOCIAL ACCOUNTING SYSTEMS

The ultimate purpose of a wealth inventory, we presume, is to better understand the complex interrelations of income flows and the "wealth of nations." We take the following as given:

1. National income and expenditure accounts (national income proper, interindustry, flow of funds) are our most important quantitative tool and set of data in national economic analysis.

2. These accounts rest primarily on business accounting records of actual transactions and estimated depreciation, following American accounting principles and conventions.

3. The present interest in "wealth accounts" derives from the belief that, analogous to business accounting, it would be useful for economic analysis if balance sheets could connect the flow accounts.

The only national double-entry system now in use is the flow-of-funds approach to social accounting which records changes in the ownership of liquid assets resulting from the flow of funds. It is no coincidence, of course, that liquid assets lend themselves most readily for such a double-entry system as they minimize the problems of valuation and imputation. Private business accounting, too, has first developed double entries for the cash account; attempts to include fixed assets in this process through depreciation reserves have remained arbitrary to the present day.

Business and social accounting again have in common that a balance sheet of net wealth is most meaningful where it is possible to establish current market prices and to impute income flows to a change in specific assets, as illustrated by inventories. As evaluation of assets moves away from current markets, and the imputation of income flows to specific assets becomes more difficult, conventional balance sheets may lose some of their analytic usefulness. Along a spectrum of increasing difficulty in this respect, at least four categories may be distinguished:

1. Market values are established at infrequent intervals, rather than currently, and the asset "inputs" have a somewhat arbitrary relation to the product "outputs," as illustrated by tangible fixed assets, such as real estate, plant and equipment.

2. Market values are, if at all, established only incidental to valuing a "going concern," and the relation between specific inputs and output is even more remote, as illustrated by intangible assets, such as goodwill or capitalized research and development expenditures.

3. Market values are not established because property rights are inalienable, though the relation of inputs and outputs may be quite direct, as illustrated by the human "wealth" of the national labor force.

4. Market values are not established because "output" does not enter the national income stream, as conventionally measured, though these assets may be the *source of substantial* social benefits, illustrated by the public domain, such as air, water, wilderness areas, etc.



The last category is of special importance in the natural resources field and suggests the need to include in the wealth inventory physical data describing assets outside any of the conventional accounting systems.

## II. PHYSICAL DATA

A detailed physical inventory of natural resources appears desirable, partly as a base for valuation, partly to cover resources essential to the "wealth" of nations though at present outside any conventional system of economic accounts, such as water and air. Major purposes of such a physical inventory would be in either case to record resource endowments and their changes over time, with the ultimate objective of relating these to national productivity and consumer welfare.

Land can be identified by area and other characteristics. Forest stands and rangeland can be brought up to date in terms of timber growth, etc. More difficult is a meaningful physical inventory of recreational resources. Approaches are suggested by estimates of visitor "capacity," number and miles of hiking paths and beaches, itemization of outstanding scenery, etc. Wildlife can be listed by major species. Special problems may arise where there is free movement across national boundaries, illustrated by migratory birds and fish.

Minerals, as "resources" and "reserves," are available in some cases from the U.S. Bureau of Mines and other sources, kept up to date by proper adjustments for depletion and new discoveries. Yet for tax reasons, reserves are frequently not divulged, and comparable data are difficult to compile in any case because of wide "quality" differentials in terms of access, chemistry and physical makeup of ore, etc.

Water resources should be listed to reflect their multiple uses for human and industrial consumption, irrigation, transportation, etc. Thus a physical inventory should include data on water flow and purity, subsurface water levels and volume, etc. Perhaps there should be a negative adjustment for potential flood and other damages.

Air is a vital resource which had become subject to pollution in many metropolitan areas. Data on air purity and climate, such as temperature, sunshine, rain and humidity, wind velocity, etc., are important as they affect production costs and consumer welfare.

Human resources are obviously the most essential component of national wealth though they may be covered in a separate inventory of the Nation's skills and knowledge.

## III. VALUATION PROBLEMS

Two different methods of valuation may be used in business and social accounting systems: book values and market values. Both have their merits but it is important to realize that the two methods are based on quite different assumptions about the basic purpose of valuation. Paucity of data may preclude a consistent choice between these two methods though a wealth inventory should ideally plan for the simultaneous application of both methods to serve the widest variety of analytic purposes.

1. Book values provide the most direct link with the business accounting records from which most of our private and social accounts are presently derived. They reflect our prevailing accounting con-

ventions and for this very reason are in many cases more readily available than market values. They may offer the most consistent way to connect balance sheet and flow accounts as presently constructed.

At the same time, book values have obvious disadvantages. After years of price changes, innovation, obsolescence, population movements, new tastes, etc., their meaning and use for economic analysis are obscure. Though all this may be of minor consequence for inventories and short-life equipment where book and market values are close, the problems for long-life assets are quite serious. Neither arbitrary depreciation deductions nor the use of price indexes—usually compiled for quite different purposes—can overcome these basic defects of book values in a dynamic economy. Some additional and distinct problems emerge for the book values of natural resources:

(a) In most cases book values will combine natural resources and capital improvements. Where a separate estimate of resources as such is desired, it is important to recognize that resources and capital may be substitutes rather than complements. Thus, a high book value may reflect poor rather than rich resources, illustrated by irrigated land, the cost of waterworks, etc.

(b) Where resources are part of the public domain, no conventional book values may have been established. Usually, the "output" of these resources will not be counted as conventional "income" either, and no meaningful connection could therefore be made in any case between stocks and flows. It is this type of resource which, though included in the physical inventory, might well be excluded from valuation for the present, as illustrated by wilderness, etc.

2. Market values would recognize the continuous change in a dynamic economy where innovation destroys old wealth and creates new wealth in a never-ending process of "creative destruction." They would permit and require the accounting for "unrealized" gains and losses in our income flows by sectors; the resultant refinements in the measurement of income flows might conceivably be more important additions to national economic accounting than wealth estimates as such.

The difficulties of estimating market values are obvious. Four cases may be distinguished:

(a) Some resources are actively traded and can be priced, readily, once their physical inventory has been established. Illustrations are provided by timber stands, agricultural land, and urban real estate.

(b) Some resources are traded only intermittently but can be priced indirectly through proxy variables. Mineral reserves may be valued by the shares of the companies owning them. Public forests may be valued by comparable property in private hands.

(c) Where no current market prices exist, values can be derived from the capitalization of expected future income. Such a valuation is subject to wide margins of error, of course, both in estimating future net income and in estimating the proper rate of discount. It is important in this context that the net income from natural resources is essentially rent, determined by the cost savings made possible by the resource. Any innovation offering

ready substitutes may drastically change the size of the future income stream flowing from this particular resource and thus eliminate the "wealth" represented by this particular asset. Illustrations are provided by the technological changes in the use of mineral sources of energy. Another illustration is provided by the "rent" of climatic advantage which "saves" the cost of air conditioning or heating. As these costs go down as a result of technological advances in climate control this will change the local comparative advantage of differential climates.

(d) Where resources are held in the public domain, any analogy with private income streams may be misleading, as the very rationale of public ownership is often the holding of natural resources for distinct benefits and purposes. Thus, still another approach is suggested by the discounted capitalization of future public benefits. Yet this approach introduces all the problems of pricing public benefits, compounded by the need to find an appropriate rate of discount which presumably depends on the time horizon of the community for whose benefit the resource is held. Where the very purpose of public ownership is to preserve natural resources for future generations, it may suggest the need to distinguish between "spot" and "future" market values. All this is highly speculative, of course, which only serves to emphasize the great difficulty of valuing what may be the bulk of our "natural wealth." Here again, for the present, these resources should be included in a physical inventory but should probably be excluded from the financial accounts.

#### IV. REGIONAL DETAIL

Regional analysis is concerned with understanding the impact of imperfect spatial factor mobility on economic growth. These imperfections are most obvious in the case of natural resources, which therefore may call for substantial regional detail to understand spatial cost differentials within the national economy. The very existence of these regional differential rents may offer an approach to the valuation of resource assets as was outlined above.

The same rationale also suggests that some local pilot project might well experiment with alternative methods to relate income flows with their resource base. While the accounting of income flows has originated on the national level, tracing the essentially closed national income circuit, the accounting for fixed assets in the national balance sheet may well start on the local level because of the spatial immobilities inherent in many natural resources.

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APPENDIX I: PART J  
CAPITAL GOODS PRICING  
By ALLAN D. SEARLE  
Bureau of Labor Statistics

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# CAPITAL GOODS PRICING<sup>1</sup>

## PROBLEMS AND PROSPECTS

A person must indeed be bold or foolhardy to attempt to treat a subject as complex as capital goods pricing, and I have never been considered bold. The subject implies some sort of agreement—or at least a meeting of the minds—on the definition of capital goods, on the nature of pricing and index number theory. This agreement has not been reached generally. These terms are inexact in their usage (and sometimes paradoxically seem to convey more meaning to the layman than to the professional). They do convey sufficient impression, however, so that we can together examine the Bureau of Labor Statistics program in this area with respect to its general scope and coverage, and the areas of greatest concentration of pricing of capital goods. Having done this, we will explore very briefly some questions of concept, some views and actions on the ever-present problem of quality change and point toward some aspirations for improvement of data in the months and years ahead.

## AVAILABILITY OF CAPITAL GOODS PRICE INDEXES

Those of you who are familiar with the WPI know it as an aggregated index consisting of a combination of price indexes for some 2,200 commodities. These items do not cover all economic activity but relate to the first significant sales—usually f.o.b plant—of the commodities as they move through primary markets. This restriction to “first sales” and the early tradition that the index covers only commodities (and the statistical and collection difficulties) have operated to discourage in practice (though not necessarily in theory) the pricing of equipment installed on site or of public and private capital, such as commercial and residential buildings, roads, powerlines, as well as the more complicated of the items which fall in the manufacturing sector itself. The WPI—despite its name—does not cover the wholesale level of activity. Goods moving in interplant transfer between plants of the same company are also omitted.

Those capital items which are included in the WPI are found almost solely in the “equipment” portion of the “plant and equipment” category of capital. Thus the “producer finished goods” category of the WPI constitutes over 600 commodities carrying about 11 percent of the total weight of the index. One half of the items and about half the weight are in the category “Finished Goods for Manufacturing Industries”; the remainder are in “Finished Goods for Non-manufacturing.” A fairly good array of industrial machinery is pres-

<sup>1</sup> Prepared at the request of the Wealth Inventory Planning Study, George Washington University, Washington, D.C., for presentation at a symposium held on Dec. 9, 1963. The views expressed are those of the author, and do not necessarily reflect the position of the Bureau of Labor Statistics.

ent, from machine tools to agricultural machinery and various special purpose machines, passenger cars and motor trucks, as well as some sheet metal products, commercial furniture, etc. The value of shipments in 1958 of all such equipment represented in the WPI accounts for almost all the value of gross private domestic investment in producers' durable equipment (\$23 billion). An additional \$35 billion is new construction and is unpriced and unrepresented. The Bureau actually prices commodities which account for from 35 to 40 percent of new investment in producers' durable equipment; price changes for the remaining 60 percent are imputed to the priced items. Table 1 shows in greater detail price coverage by SIC four-digit industries which are important producers of capital equipment.

TABLE 1.—Price coverage for capital goods industries

SIC code	Industry title	Value added in 1958 (thousands)	Price coverage <sup>1</sup> (percent)
35	Machinery, except electrical		
3511	Steam engines and turbines	\$568, 643	45.8
3519	Internal combustion engines (except automotive and aircraft)	499, 328	34.5
3522	Farm machines and equipment industry	1, 087, 836	39.1
3531	Construction machinery industry	1, 022, 801	9.6
3532	Mining machinery and equipment	165, 831	28.4
3533	Oilfield machines and equipment	336, 788	66.9
3534	Elevators and moving stairways	126, 270	13.5
3535	Conveyors	192, 892	52.6
3536	Hoists, cranes, and monorails	92, 759	19.2
3537	Industrial trucks and tractors	117, 500	51.9
3541	Metal-cutting machine tools	420, 961	25.9
3542	Metal-forming machine tools	176, 021	13.9
3544	Special dies and tools	780, 090	1.0
3545	Machine tools accessories and measuring devices	348, 580	36.4
3548	Metalworking machinery, except machine tools	332, 397	26.4
3551	Food products machinery	268, 639	21.1
3552	Textile machinery	214, 199	39.2
3553	Woodworking machinery	112, 936	34.5
3554	Paper industries machinery	123, 758	0
3555	Printing trades	188, 881	44.6
3559	Special industrial machinery	431, 117	3.2
3561	Pumps and compressors	542, 037	16.2
3562	Ball and roller bearings	407, 744	36.4
3564	Blowers and fans	145, 050	11.0
3565	Industrial patterns	78, 108	0
3566	Power transmission equipment	384, 372	34.0
3567	Industrial furnaces and ovens	96, 450	56.6
3569	General industry machines, not elsewhere classified	281, 423	1.2
3571	Computing and related machines	579, 103	22.7
3572	Typewriters	168, 877	67.4
3576	Scales and balances	49, 125	54.4
3579	Office machines, not elsewhere classified	173, 424	62.3
3581	Automatic vending machines	64, 694	69.8
3582	Commercial laundry equipment	65, 580	0
3584	Vacuum cleaners, industrial	4, 256	0
3585	Refrigeration machinery	598, 032	19.7
3586	Measuring and dispensing pumps	64, 689	1.3
3589	Services industry machines, not elsewhere classified	120, 900	.8
3599	Machine shops industry	959, 099	3.7
36	Electrical machinery, equipment, and supplies		
3611	Electric measuring instruments	419, 396	12.2
3612	Transformers	364, 212	44.4
3613	Switchgear and switchboard apparatus	555, 044	40.9
3621	Electric motors and generators	813, 124	24.2
3622	Industrial controls	281, 890	19.1
3623	Welding apparatus	112, 709	39.2
3624	Carbon and graphite products	102, 483	64.1
3629	Electric industrial goods, not elsewhere classified	137, 547	.3
3631	Household cooking equipment	181, 091	60.4
3632	Household refrigerators	433, 369	61.9
3633	Household laundry equipment	324, 480	73.7
3634	Electric housewares and fans	301, 033	24.0
3635	Household vacuum cleaners	84, 180	83.9
3636	Sewing machines	61, 091	25.2
3639	Household appliances, not elsewhere classified	162, 664	44.2
3641	Electric lamps	270, 498	43.2
3642	Lighting fixtures	397, 378	59.2

See footnote at end of table.

TABLE 1.—Price coverage for capital goods industries—Continued

SIC code	Industry title	Value added in 1958 (thousands)	Price coverage <sup>1</sup> (percent)
3643	Current carrying devices.....	\$294, 189	9.2
3644	Noncurrent carrying devices.....	214, 607	22.8
3651	Radio and TV receiving sets.....	593, 953	65.8
3652	Phonograph records.....	93, 073	85.3
3661	Telephone and telegraph apparatus.....	740, 855	7.5
3662	Radio and TV communication equipment.....	1, 297, 583	1.6
3671	Electron tubes, receiving.....	285, 799	79.5
3672	Cathode ray picture tubes.....	67, 472	96.3
3673	Electron tubes, transmitting.....	165, 803	0
3679	Electronic components, not elsewhere classified.....	914, 811	.1
3691	Storage batteries.....	150, 061	25.7
3692	Primary batteries, dry and wet.....	75, 431	46.6
3693	X-ray and therapeutic apparatus.....	58, 436	9.5
3694	Engine electrical equipment.....	366, 626	35.7
3699	Electrical products, not elsewhere classified.....	73, 581	15.8
37	Transportation equipment.....		
3713	Truck and bus bodies.....	145, 608	4.9
3715	Truck trailers.....	131, 140	7.3
3717	Motor vehicles and parts.....	6, 473, 927	91.3
3721	Aircraft.....	3, 399, 163	0
3722	Aircraft engines and parts.....	1, 615, 671	0
3723	Aircraft propellers and parts.....	112, 301	0
3729	Aircraft equipment, not elsewhere classified.....	1, 797, 203	.2
3731	Ship building and repairing.....	913, 687	.7
3732	Boat building and repairing.....	157, 309	0
3741	Locomotives and parts.....	152, 086	59.2
3742	Railroad and street cars.....	167, 576	28.0
3751	Motorcycles, bicycles, and parts.....	52, 125	49.5
3791	Trailer coaches, housing type.....	127, 683	0
3799	Transportation equipment, not elsewhere classified.....	38, 215	15.0
	Selected industries from major group 25, furniture and fixtures:		
2521	Wood office furniture.....	38, 427	57.3
2522	Metal office furniture.....	173, 673	66.6
2531	Public building furniture.....	112, 881	6.1

<sup>1</sup> Price coverage is the percentage of an industry's shipments represented by the value of individual products which are priced directly. Individual products are those represented by 7-digit census codes. Although every product variant within a 7-digit code may not be directly priced, commodities within the same product code are considered to be relatively homogeneous and are, therefore, assumed to have identical price movements. For some priced products, census values have been withheld for disclosure reasons. In computing the price coverages, these product values are considered to be zero. Hence, for some industries, actual price coverage is greater than that shown in this table.

Price indexes for the capital goods in the WPI became available at different dates as the index grew. Items of farm equipment were in the index in 1912 or 1913, as were motor vehicles. Some commercial furniture dates back to 1926. Most of the impetus to pricing machinery came with the 1952 major revision of the index, however, when many machinery indexes were added to the indexes often retroactively to 1947. Specially computed indexes (not in the WPI) and some component product detail are available back to 1939 for machine tools, construction machinery, and general auxiliary machinery.

While (with some exceptions) the Bureau of Labor Statistics is not engaged in pricing capital goods other than those described above, some work is being done by others.

The Bureau of Reclamation prepares an index of irrigation and hydroelectric costs and the Interstate Commerce Commission computes an index of railroad construction costs. A number of private agencies produce local and national indexes of construction costs. The Department of Commerce prepares a "composite" construction cost index which is built up from component price and cost indexes from various private and public sources. The methods, sources, and construction of these is so varied, however, that it is difficult to say how satisfactory they are. According to the report of the Price Statistics

Review Committee,<sup>2</sup> "with the exception of the Bureau of Public Roads for a composite mile of highway, and the Interstate Commerce Commission series for railways and pipelines, these cost indexes do not approximate cost \* \* \*. For the most part, they are, instead, indexes of wage rates and building materials prices weighted together in accordance with their importance in the cost of a unit of construction of some specified type in a base period." Indexes of capital goods prices which are constructed as weighted materials input and wage-rate combinations fail to reflect the technological productivity changes which take place in the capital goods producing industry. Variations in profit margins are also neglected. These indexes do provide historical data for a considerable number of years, however, and must serve in the absence of better statistics.

Current investigations by the Bureau of the Census are also noteworthy. Two principal types of construction are being priced: Family houses built for sale and publicly financed apartment houses in New York City. The multiple regression approach is being used to isolate and evaluate price determining factors in the construction of family houses. The pricing of apartment houses in New York involves the use of detailed figures from bidders on the cost of units of work such as excavation, plumbing, electric, and heating installations. These studies are still in embryo, and some inconsistencies of basic data are under scrutiny. I am told that preliminary results of the apartment house price index seem reasonable: (1) There has been less secular increase in the census index than in the conventional indexes in which labor and materials indexes are combined. This could result from the failure of the conventional series to take proper account of productivity increases which the census index adjusts for inherently. (2) The new index is more responsive to short-run changes in cycle. This could reflect the changes in "cushion" or profit margins which occur as the industry experiences favorable or unfavorable conditions.

#### PURPOSES, CONCEPTS, PROBLEMS

Purposes, concepts, and problems can never be viewed independently by the student of price change. A purpose which will serve one user very well will prove unsatisfactory to another and each use will imply a different concept of price and pose different measurement problems. The difficulty faced by an agency such as BLS is that the users of data have varied needs and the Bureau's limited resources can satisfy the users only partially. This has led to some fuzziness in concepts and revisions of techniques over time. When one recalls that the WPI began in 1890 it is remarkable that concepts have remained as uniform as they have.

It is fair to state that in common with pricing for other products and services, capital goods are priced for three general purposes—for themselves, i.e., for comparison of capital goods price trends with those of other products or with labor rates in capital goods industries, at a fairly detailed level. Another purpose is for deflation of capital

<sup>2</sup> "Government Price Statistics," hearings before the Subcommittee on Economic Statistics of the Joint Economic Committee of the United States, pt. I, Jan. 24, 1961, app. B, Construction Price Indexes, p. 87.



goods expenditures in order to arrive at some measure of real expenditure, cost, or output or productivity of capital. The third purpose is macro-analysis in which aggregations of indexes are used in broad studies of domestic and foreign price levels, inflation, valuation of wealth, interindustry analysis, and other topics relating to the general economic well-being of the Nation. This last purpose views pricing of capital goods as part of the large family of price measures which the Federal Government is coming to regard as a vital part of the general structure of statistical data on prices, production, man-hours, payrolls, etc.—generally tied into the framework of the Standard Industrial Classification and through this to the national accounts. This purpose stresses *comparability* of pricing *scope* with other economic data, *breadth* of coverage or at least representation, and availability of data through *time*.

It is well known, of course, that, in theory, each specific purpose calls for a specific kind of index number of prices. At the aggregate level it can be demonstrated quite easily that the use of a Laspeyres, fixed-weighted, *price* index for deflation results in a *quantity* measure of the Paasche type. If a Laspeyres quantity index is desired, a Paasche (changing weight) price index is needed as a deflator. Paasche-type price indexes are hard to derive, however, owing to the dearth of current value or quantity data in detail. For this reason, an approximation to a fixed-weight quantity index can be obtained if price indexes in sufficient detail at the individual commodity level are available to deflate value data in the same detail. Summing the deflated detailed values yields a quantity series with fixed weights, i.e., in a quantity index of the Laspeyres type. Thus the Commerce Department—wishing a series on GNP in constant dollars—must either deflate total value by a Paasche (changing weight) price index, which is unavailable, or deflate individual values by commodity price indexes and sum.

These broader problems of concept and their attendant algebra have received wide treatment and I mention them only in passing. Of more fundamental importance is the question of concept of price change at the detailed commodity level. Questions of concept and their consequent measurement problems are common to all price series in some degree, but in the area of capital equipment they are especially severe. Let us start with a general statement concerning what users of price time series can be presumed to require as a minimum: "A price series (index) should compare the payment (or receipt) for *one unit* of an *item* or *service* with the *payment* for an *identical unit* at another time." In practice, of course, the index maker must define markets, volume of sales and many other factor. But as a simple statement the proposition does not seem too inexact until one attempts to apply it to the real world of prices. At this point the phrase "identical unit" has different meanings to different users depending on their purpose. Should pricing be in terms of identical units of physical quantity or of utility? An index of prices of truck tires will rise more rapidly than one based on truck-tire-miles, for example, because of improved durability of the tires (and better roads). If earth-moving machinery is purchased for the purpose of moving earth (as it is) should not price per machine be replaced by price per cubic yard of dirt-moving capacity per hour? In this case the unit priced is no longer the machine

but the work performance. Should price per light bulb be replaced with price per lumen-hour taking into account the expected life of the lamp?

Obviously, the answer to these and similar questions cannot be categorically settled. In deciding among alternative purchases, the buyer of construction equipment has a legitimate use for an index which measures the utility of the machine to him, i.e., a price index which declines when machines become more efficient even if the price tag remains constant. He and many market analysts, economists, and businessmen also need to measure the price movements for goods of similar *physical* characteristics, for this is the form in which goods are bought and sold in the market. For this purpose the appropriate index is one unadjusted for utility change *unless accompanied* by a change in physical specification.

Considerable thought and experiment has been devoted to defining the unit of measure and to the isolation of price determining factors embodied in changes in utility. Among the early efforts Andrew Court<sup>3</sup> suggested a technique wherein specification changes are related (by means of a multiple regression technique) to price. Derived implicit specification prices from cross sectional data were used in pricing the time series. More recently Richard Stone used a similar approach in "Quantity and Price Indexes in National Accounts."<sup>4</sup> Zvi Griliches of the National Bureau of Economic Research also used the approach in a staff paper for the Stigler Committee. Messrs. Dean and de Podwin have also provided recent, interesting expositions in the field of electrical equipment. In the Griliches paper, automobiles is the subject of the experiment and factors considered are horsepower, weight, length, type of engine, type of transmission, etc.

The findings of this experiment pointed to an overstatement of the WPI passenger car index, yet Griliches stated that limitations of the "hedonic" (regression) approach are such that "it is not yet recommended that such adjustment should be made routinely as part of the price index computations." Among the examples of limitations: weight in cars is not per se desirable but serves as a proxy for size. For instance, if aluminum were substituted for steel and if the hedonic approach were used mechanistically the resulting weight decrease would automatically be treated as a quality deterioration. Richard Stone, after showing a high correlation between price and alcoholic content for various types of wine points out that "there are evidently a number of other quality characteristics that influence price. In a refined analysis it would be necessary to track these down \* \* \*." I for one concur, but despair of carrying the approach really into the labyrinth of subjective preference and in capital goods as well as in wine, subjective preference or taste is the realm that sets the glutton off from the connoisseur.

#### *The BLS approach to the quality problem*

Consequently, the BLS is following what is today, for us, a more workable approach to quality adjustment—making the adjustment only when accompanied by physical specification changes which can

<sup>3</sup> "Hedonic Price Indexes, with Automotive Examples," A. T. Court, American Statistical Association, Dec. 27, 1938.

<sup>4</sup> Published by the Organization for European Economic Cooperation, November 1956.

be "costed out" and then only when in the judgment of the commodity specialists they do not involve purely subjective factors. Under this principle the introduction of a more comfortable seat in a tractor would not be subject to adjustment normally. If, however, tractors of identical specification other than the seat were selling in the same market at the same time—or if the comfortable seat were a separately priced option—we would bow to the judgment of the market and make the adjustment. Recently, we had one of our rare opportunities to choose between an adjustment in the price of a fluorescent lamp for factory and commercial use. The new longer life light was introduced by some manufacturers at no change in quoted price and our choice was to take the price reduction on the basis of the length of life expectancy or to use the ratio indicated by the market price (of other reporters) for both types of light selling side by side on the market. We chose an estimate based on the latter. Recently we could have made an adjustment in the price of an off-highway dump truck on the basis of a combination of specification changes including horsepower, load-carrying capacity, gross weight, and net weight. Here, we were unwilling to assume that the percentage changes in physical characteristics were proportional to price change and, in the absence of data on the cost of the additional features, a link was taken. This had the effect, of course, of assuming that the entire reported price change was due to quality improvement. To the extent there really was a price increase, the BLS index is too low for this item.

While it is always hazardous to assign reasons for the actions of an organization, I will propose several that I feel are behind the Bureau's reluctance at present to adopt the kind of quality adjustments based on the correlation approach:

1. Current data are generally lacking to enable the computations to be made except retroactively and too late for current index calculations.

2. Where they are available, more research is required to separate out those changes which would generally be acknowledged to be quality changes from the more controversial, subjective factors of style and preference.

3. Most important, the Bureau is not convinced that certain adjustments *should* be made. The Bureau needs and will seek guidance concerning the principal purposes to which price indexes for capital goods will be put. The resolution of purpose may determine the more basic question—whether certain adjustments *should* be taken even if data are available.

This last statement leads to a discussion of one specific purpose of capital goods pricing—measurement of the productivity of capital. Edward F. Denison<sup>5</sup> has examined three approaches to viewing the productivity of capital:

1. The cost approach—in which the quantity of capital would remain the same in year 2 as in year 1 if the same number of physical units of a particular capital item are produced (even though work performance per machine had increased) unless there is a cost change.

<sup>5</sup> "Theoretical Aspects of Quality Change, Capital Consumption, and Net Capital Formation," Edward F. Denison in "Problems of Capital Formation," National Bureau of Economic Research, 1957.

2. Capital input proportional to total output—in which a machine in year 2 costing the same as in year 1 but capable of twice the output in a given time would be measured as two machines.

3. Capital stock measured by the contribution of capital to production—in which consideration would also be given to reduction in the work force required to run the machine.

Denison feels choice 3 is of interest but not feasible because of measurement problems. Choice 2 defeats his purpose. If the quantity of machines is to be measured in terms of machine output, then the productivity ratio, output per machine, must remain constant over time. This approach adjusts out of the measure the very factor which should remain in and which is to be measured. He settles on choice 1 and tells us that adjustment for quality change should be made only where accompanied by cost change.<sup>6</sup>

The policy of BLS, then is consistent with Denison's need—adjustment for quality (specification) change is made only where a cost change is present. In practice, the Bureau often obtains from reporters the cost of added (or deleted) features on machinery, autos, trucks, and a variety of other goods and makes an appropriate adjustment by adding (or subtracting) the cost to the price of the earlier model to attain price comparability with the new model. Where this is not possible, a judgment is made and either a direct price comparison or a link is taken depending on whether the reported price change is deemed mostly due to genuine price change or to quality change.

#### *Other problems of pricing*

Problems other than quality change inhibit development of truly accurate and timely pricing of capital goods, in areas where BLS is now pricing. While the usual standard discounts (cash, trade, quantity, etc.) are reported and used, many "special deals" to a few customers are not. If these are unusual, and not made generally available to customers, they should not enter into construction of a price index, but in times of severe competition special discounts may and do become widespread. BLS has on the whole found reporters unwilling to report these (there are exceptions) and long-run plans are being drawn up to see whether a study of buyers' prices can point the way to true transaction prices. Such a study would require the examination of customers' invoices to determine the net market price paid. In the meantime, reliance must be placed on the hope that manufacturers ultimately adjust list prices toward reality (though after a time lag) when the quoted list price with discounts drifts away from the market transaction price.

#### THE GAPS AND CHALLENGES AHEAD

To go further into BLS problems would involve more detail than warranted here. Let us instead turn to some tentative plans.

As indicated earlier, large areas of capital goods remain unpriced. Many of these goods consist of unique or infrequently priced, complex products such as ships, power generators, electronic computers, and

<sup>6</sup> An aside: Denison also states that there may be justification for adjusting consumer goods (CPI or WPI) for use values. This goes beyond the scope of a discussion of capital goods pricing, however.

aircraft. In these cases, where monthly detailed specification pricing is impractical, the usual monthly shuttle form which goes to reporters for entry of the latest quotation is inadequate. Special pricing techniques will have to be developed, and assistance or advice will be appreciated.

The WPI and related industrial pricing programs do provide some instances of special pricing methods which might be extended to the more difficult areas. For example, fabricated structural steel prices for buildings and bridges are obtained from producers who reprice each month an actual job on which they had recently been successful bidder at the time pricing was initiated. Prices are computed on costs of current labor, material, conditions of the market and profit. This method is used in the United Kingdom and the Netherlands for pricing ships. It is my understanding that some of the privately computed construction cost indexes also employ this technique or in some way take account of productivity change.

Our index for hydraulic turbines is prepared for a special purpose (outside the WPI). This index makes use of actual detailed plans (blueprints) of prototypes of steel castings, steel forgings, gray iron castings, and steelplate. Price series so derived are combined by the users with wage series to escalate turbine prices.

The use of the "hedonic" approach, the development of prices from prototypes or simulated plans, and the "recipe" approach wherein prices of component materials and labor costs are weighted and combined will all be thoroughly investigated. (One difficulty with the combination of materials and labor cost input data, of course, is the failure to take into account the changes in productivity which occur. This has been one of the limitations of some of the construction price indexes built up on this basis.)

These techniques will be explored in the coming year and later as the Bureau moves ahead more intensively in its work of constructing an industrial sector price index in which the present WPI data are to be used as a foundation to build a new pricing structure related to the SIC. Initially stress will be on pricing industrial outputs—inputs will come in later years. Current plans call for expanding pricing into new areas modestly in the coming year and more intensively as resources become available. The initial stress will be on expanding coverage in manufacturing, mining, and agriculture. We plan to devote considerable attention to development of techniques for pricing unique goods not made to uniform specifications, such as electronics, shipbuilding, and aircraft.

Ultimately attention will be devoted to other gaps such as wholesale trade, transportation, and construction. Whatever additional pricing of capital goods is undertaken will in all probability be done on a current basis with pricing extending no more than a year back. It is extremely difficult to obtain the assent of reporters to really comprehensive historical pricing, especially for commodities which are not homogeneous and which are subject to frequent specification change.

Some companies maintain historical price indexes for segments of capital goods covering a considerable number of years. Those who need historical prices may find solace in these and in some of the efforts recently put forth by Dorothy Brady of the Wharton School, Univer-

sity of Pennsylvania.<sup>7</sup> Using old records from State agencies as well as earlier price investigations, she has pieced together some indexes from the early 1800's for sailing vessels, steamboats, steam engines and turbine water wheels, lathes, textile machinery, and factory buildings. These and similar series prepared from dustcovered records cannot deal adequately, if at all, with the many changes in specifications, quality, discounts, and markets with which we try to deal today. They may be our only link to the past, however, and further efforts toward reconstruction should be encouraged.

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<sup>7</sup> "Relative Prices in the Nineteenth Century," paper presented before the Conference on Research and Wealth, Sept. 4-5, 1963.

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NOTE.—At the Wealth Study symposium on valuation and pricing problems, Mr. Clement Winston of the Office of Statistical Standards commented, " \* \* \* BLS ought to show a greater interest in these private series, and possibly make arrangements for a joint operation of the work thus improving series already in use and getting something useful to themselves and others out of it. The use of private data sources might also prove particularly fruitful for constructing price indexes for past years."

JOHN W. KENDRICK.

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APPENDIX I: PART K  
SOME PROBLEMS IN THE ESTIMATION OF SERVICE  
LIVES OF FIXED CAPITAL ASSETS

By ROBERT C. WASSON  
Office of Business Economics

## SOME PROBLEMS IN THE ESTIMATION OF SERVICE LIVES OF FIXED CAPITAL ASSETS

The comments I shall make here do not necessarily reflect the position of the Office of Business Economics, nor are they concerned with the proper method of computing service lives for tax purposes. The focus is on the type of service life measures which are of value in estimating stocks of fixed capital and related variables, such as discards and depreciation, for the purpose of economic analysis.

### BULLETIN F LIVES

Mean service lives in the past have been based largely on Bulletin F tables. Actual means derived from this source have varied because of the weights employed, i.e., the relative proportions of total equipment purchases allocated either implicitly or explicitly to specific types. Whether computed carefully or by quickie methods, the use of Bulletin F averages without appropriate reduction factors is no longer acceptable, in view of the availability of Treasury Survey and Internal Revenue Service Life of Depreciable Asset (LDA) data. Survey of Current Business manufacturing, depreciation, and net asset tables based on Bulletin F lives will, of course, eventually be eliminated. The discussion of the nature of the replacement is a matter which has been deferred, as far as I am personally concerned, by the pressure of more urgent phases of our benchmark revisions.

### BIAS IN THE USE OF A SINGLE MEAN

The use of Bulletin F as a point of reference, however, temporarily may be of value as a means of providing a rough method of computing a distribution. For example, a score of producers' durable equipment classes can be broken into more than a hundred different types, and the dispersion of lives greatly increased and made more realistic. The use of a dispersed pattern as contrasted with a single mean for equipment is quite important in computing gross stocks or depreciation by the perpetual inventory method. In a realistic model, I have found the simpler procedure created an upward bias of more than 10 percent in the level gross stocks. The bias in the case of net stocks was much less because of the offsets of gross stock and depreciation biases. This is one argument, incidentally, in favor of the use of net stocks over gross stocks, but otherwise I find nothing to criticize in Vernon Smith's preference for gross over net. It's a position I have held for years. A second priority might be given to depreciation, to which measure Denison gave first importance. One of the great advantages of net stocks is its reflection of the age factor. This can and should be shown more directly by the use of mean ages. The comparative advantages of the use of the gross-net ratios and of mean age are described by George Jaszi in a November 1962 Survey of Current Business article.



## USE OF A CURVE IN DISTRIBUTING LIVES

Returning to the service life problem, consideration should be given to a different device than dispersion based on a large number of combinations of lives derived from Bulletin F. The best known one, and I should also say the principal one that comes to my mind, is the MAPI device of the Robley Winfrey S-3 curve.<sup>1</sup> This curve assumes a symmetrical distribution around the mean in which the latter is one-half the maximum age and the degree of peakedness is moderate. Another researcher, Radivoj Ristic of Fortune magazine is also making use of this curve, which he refers to as the "MAPI" curve. It is being applied to a number of expenditure series, the Office of Business Economics 21 types of equipment, and also to construction.

Does the use of the curve include advantages not had by the grouping of a number of types of equipment and computing a number of averages? I don't really know the answer to this question, but I shall indicate my present mixed feelings on this subject as follows:

As a method of converting a single series with one mean into a number of series for the purpose of computing gross stocks, the S-3 curve is more realistic than failure to make a distribution. The original Winfrey distributions themselves, unlike our computations from Bulletin F which are merely an attempt to compute more means for a large number of relatively homogeneous types of equipment, resulted from mortality patterns around the means of such, or even more, homogeneous groups. Furthermore, some of the items considered by Winfrey, such as railroad ties, are treated as current expense, not capital items, and in general the items studied could hardly be accepted as statistically representative of capital. This became apparent when, almost a decade ago, we tried to match the detail in the Winfrey study against that in producers' durable equipment. It is both a compliment to the genius of this man, who is at present employed by the Department of Commerce in the Public Roads Administration, and a sad commentary on the research that has been done since, that his 1935 study is still not treated as obsolete.

As far as the particular curve selected, the S-3 curve, is concerned, I know of no particular justification for preferring it nor have I strong evidence that it is wrong.

It does impose, however, a type of uniform smoothness that is quite at variance with what we get by averaging equipment groups, and it seems likely that the degree of peakedness is exaggerated. These impressions of mine are based on Bulletin F derived means. They should be checked some day by a study of more recent data, such as those in the Treasury and LDA studies relating to distribution by service life, and also by obtaining new data related to actual practice.

## INTERNAL REVENUE SERVICE STUDIES OF USEFUL LIFE

This leads to a consideration of the use of the Treasury and LDA data for computing service life means. The first question to consider is whether such tax-oriented data are realistic in a business sense. The Treasury Survey has one measure which assists in evaluating this point,

<sup>1</sup> See Robley Winfrey, "Statistical Analyses of Industrial Property Retirements," Iowa Engineering Experiment Station, Bulletin 125.

the amount of completely depreciated assets on hand. These vary greatly by industry, but average approximately 10 percent only for all manufacturing property and only about 7 percent when property written off under the 5-year life provisions of emergency amortization is excluded.

Much of such property may be held for only occasional use or pending the rise of scrap prices to the proper level. To what extent is property completely depreciated and then taken out of the balance sheet, but still used in everyday production? There would be what might be considered two successive accounting errors in this understatement of assets and service life. The first error would be in depreciating the equipment over too short a life. Until the issuance of the guidelines in July 1962, and with the principal exception of property subject to emergency amortization, Internal Revenue Service auditors expected such underestimates to be corrected in succeeding income periods. There were some types of group accounts for which this could occur, such as furniture and fixtures, without the true situation being known by either the IRS or the reporting firm. Physical inventories cannot always be easily compared with value figures. The second error would be the removal of the completely depreciated asset (and its reserve) from the balance sheet even though it continues to be used. Insofar as the IRS caught the first error, of course, it would have forestalled the second. Some years ago, we discussed this point with a Washington representative of one of the country's largest accounting firms. He assured us that it was his firm's policy to instruct its clients to reinstate these assets on the balance sheets, and this had occurred in the case of a Washington company only a few days before. The policies of such accounting firms, however, may not be influential enough to prevent a substantial amount of gross assets being removed from balance sheets prior to actual discard.

#### BIASES IN DERIVING SERVICE LIVES FROM GROSS STOCK AND DEPRECIATION DATA

Now we come to some computational problems which can greatly affect our results. Assuming that we wish to obtain service lives (or depreciation rates) which are applicable to capital inputs, i.e., the investment of each year, and not to a gross stock figure, should the IRS asset tabulations, either from the Treasury survey, or LDA study, be used as weights for service lives, or as weights for depreciation rates? Patrick Huntley and I have both argued that when assets are used as weights, they should be used with depreciation rates, not service lives. In a long period of stable investment the first procedure will give the correct answer and the second procedure will yield a service life that is biased upward. In a long period of rising investments such as we have experienced in a somewhat erratic fashion, neither procedure yields the correct answer. The weighted service life method still tends to be biased upward, although less so than under stable conditions, and the depreciation method is biased downward.

This point is illustrated by a simple example in which equal amounts are invested in equipment items having service lives of 10 years and of 5 years, with the annual investment always having a mean service life of 7.5 years.

In case I, the annual amounts of investment are unchanging with 50 each year for 10-year items and 50 for 5-year items, and the level of stocks reaches stability at the end of the 10th year. At this point and thereafter, weighting depreciation rates by gross stocks yields the correct mean service life, 7.5 years, but weighting service lives by gross stocks yields a service life of 8.33 years.

*CASE I.—Gross stocks in year*

	1	2	3	4	5	6	7	8	9	10	11
10-year item.....	50	100	150	200	250	300	350	400	450	500	500
5-year item.....	50	100	150	200	250	250	250	250	250	250	250
Total.....										750	750

Weighting depreciation rates by gross stocks :

$$\begin{array}{r} 500 \times .10 = 50 \\ 250 \times .20 = 50 \\ \hline 100 \end{array}$$

$$\frac{\text{Gross stocks : } 750}{\text{Depreciation : } 100} = 7.50 \text{ years}$$

Weighting service lives by gross stocks :

$$\begin{array}{r} 500 \times 10 = 5,000 \\ 250 \times 5 = 1,250 \\ \hline 6,250 \end{array}$$

$$\frac{6,250}{750} = 8.33$$

In case II, in the sixth year the annual amount of investment of both the 10- and the 5-year items is doubled.

*CASE II.—Gross stocks in year*

	1	2	3	4	5	6	7	8	9	10
10-year item.....	50	100	150	200	250	300 50	350 100	400 150	450 200	500 250
5-year item.....	50	100	150	200	250	250 50	250 100	250 150	250 200	250 250
Total.....										500 1250

Weighting depreciation rates by gross stocks :

$$\begin{array}{r} 750 \times .10 = 75 \\ 500 \times .20 = 100 \\ \hline 1,250 \end{array}$$

$$\frac{\text{Gross stocks : } 1,250}{\text{Depreciation : } 175} = 7.14$$

Weighting service lives by gross stocks :

$$\begin{array}{r} 750 \times 10 = 7,500 \\ 500 \times 5 = 2,500 \\ \hline 10,000 \end{array}$$

$$\frac{10,000}{1,250} = 8 \text{ years}$$

One practical device for minimizing the error in using total gross asset weights under these conditions is to construct realistic models in order to determine the approximate magnitude of the bias.

#### TREATMENT OF STOCK ACQUISITIONS AS SERVICE LIFE WEIGHTS

The Treasury and LDA tabulations offer a breakdown, however, that leaves another avenue of escape from the bias problem. This is the separate tabulation of assets purchased after 1953, that is to say, assets purchased during the six-year period 1954-59 inclusive and still in existence at the end of 1959. These assets can then be treated as though they were purchase figures and used to weight service lives, not depreciation rates. Both the Treasury and LDA tabulations have employed this weighting scheme, as well as the alternative one of depreciation rates. When weighted service lives are used, however, equipment needs an adjustment for discards of items with a life of 5 years or less. A precise measure of the overall correction to be made by this adjustment is not available, but it might be a reduction of approximately 1 year.

#### IMPORTANCE OF CONSISTENCY IN DEFINING STRUCTURES AND EQUIPMENT

Another problem in computing service lives from the IRS data and then applying them to investment data derived from other sources is in matching the appropriate relative quantities of structures and equipment. If what is called structures in the IRS tabulations is a higher (or lower) proportion of the total than what is called structures in our investment series, the average implicit life in our synthetic series will be biased upward (or downward). There is some reason for thinking that this type of bias can be substantial and is of more than academic interest. This argues for, among other things, not treating equipment in complete isolation, but together with structures as a separable component of capital. In other words, we should try to insure that our treatment of equipment is consistent with our treatment of structures and that their combined average approaches the best estimated. This problem arises in a more acute form in making estimates for specific industries, especially utilities, and the possible existence of overlaps or gaps in the matching of equipment and structure service lives with their appropriate relative shares of total fixed investment should be considered.

The last point leads us to the noncorporate problem, but here the issue is more one of what lives, based mainly on corporate data, to apply to what values of investment rather than how to measure the service lives from noncorporate asset data, because the latter largely do not exist as yet in any available form which is useful for this purpose.

#### ADJUSTMENT OF IRS DATA FOR POSTWAR LEGAL CHANGES

Some of the objections to service lives computed from IRS data, e.g., the use of emergency amortization and declining balance depreciation, do not apply to the special Treasury and LDA tabulations, but they do apply to the regular statistics of income tabulations for all post-World War II years except 1946-50, and emergency amortiza-

tion may have some, though possibly slight, distorting effect on tabulations for those years. After 1950, the distortions in assets caused by the legal changes require adjustments. The failure to make these adjustments in a recent publication of the National Bureau was justified by arguments that I find unacceptable, although I would not argue that the failure to make the adjustment was an important omission for more than a relatively few 3-digit industry groups.

One weakness in the tax-oriented data which persists in the special tabulations is that arising from the special tax treatment given to expenditures for exploration and drilling of oil and gas wells. Adjustments should be made for this, and I shall be glad to discuss this point if questions are raised.

#### APPARENT DIFFERENCE BETWEEN THE WAR AND POSTWAR SERVICE LIVES

One last point will be made, the record of pre-World War II service lives as revealed by IRS Statistics of Income data. The drastic change in service lives as computed by Patrick Huntley for his Ph. D. thesis may, in part, reflect changes in composition, e.g., relative amounts of equipment and structure, but it is not likely that this alone could have yielded such big differences. A change in the composition of structures, e.g., the increase in the relative amount of short-lived additions and alterations, could have been one but not the only contributing factor. This problem seems to me to be one deserving more intensive analysis.

#### COMMENTS ON THE PAPER BY ROBERT WASSON

By George Terborgh

The depreciation method to use is a basic decision to make in wealth estimates and deserves the most careful attention. I played around with the problem 10 years ago, when my book was in preparation. I came out with the conclusion after some empirical studies of the movement of resale values and some theoretical calculations of declining use value, that the runoff rate ought to be somewhat faster for short-lived assets than for long-lived. For the former, a good conservative target is to write off two-thirds of cost in the first half of the service life. I rigged up a writeoff schedule that recovered 60 percent instead of two-thirds of the cost of long-life assets such as buildings and structures over the half-life. Well, you can cook your own schedules. The only proposition I am prepared to offer is that you ought to have a substantial degree of acceleration in the writeoff, that straight line is a retarded method. Whether you settle in the area I did, or whether you go to the left or right of it, is your headache. This is, however, an absolutely fundamental preliminary decision for wealth estimates.

Now, am I right, Bob, that you are proposing to use as your basis the "Statistics of Income"? I admire your hardihood, but would despair of that approach myself, for the reasons you've suggested. We have had a lot of flux and change in writeoff practices over time, and I don't see how anyone can figure the proper depreciated value of industry's assets from the history of tax writeoffs.

WASSON. I want to distinguish between three sources. One is the "Statistics of Income," and this has been available for a long time; then the Treasury Survey, and finally the Life of Depreciable Assets. The fundamental difference between the type of data, here and here [pointing to the board]—these are just tabulations of depreciation—that here and here [pointing again] are in terms of what they actually use; for example, for tax purposes, with double declining balance in the first year for a 10-year item, the depreciation is 20 percent. So if you divide depreciation into the asset, you get 5, not 10, but the Treasury Survey instructions told the reporting firms that in such a case the answer should be 10. In other words, the life was not derived indirectly, the respondents were told how to estimate it.

TERBORGH. But look, the basic flaw is tax depreciation lives. I don't think that there is any close relation between the two and what you are interested in is service lives and not the tax lives.

WASSON. In most industries, I have been assured by the IRS people at various times, that when a report is audited an attempt is made to determine whether the life that has been used is realistic.

TERBORGH. That is where I part company. We questionnaired our own members on the tax lives they were getting on shop equipment, and what they were getting on factory buildings. We received a pretty good response—about 270 companies, all in the same general type of business, all metal working companies. The dispersion of these tax lives was something fantastic; I simply do not believe that there is any comparable dispersion of actual lives. But this is not the only bit of evidence; you can talk with these fellows and find out how they got their tax lives in the first place. These are negotiated lives on an individual company basis, and theoretically adhere to the retirement practice of the individual taxpayer. The fact is that very few of them have the kind of exhaustive retirement analysis that would permit them to arrive at their true average life expectancy. Depreciation allowances generally get caught up in a trading process. Usually they get in the final trade-out on audit. One company will trade for one item, another for another; one agent will be a bearcat on depreciation, another won't care. After this process goes on for a series of years, the disparities that accumulate between allowable tax lives and the actual lives of assets are, as I said, simply fantastic. So with all due deference to the boys in the IRS, I still would recommend the acceptance of tax-life distributions as a satisfactory measure of actual-life distributions. Don't ever kid yourself that you have the answer when you are dealing with tax lives. So far as I know, these are all that the Treasury has. If they tabulated actual lives in connection with their study, they have not published them and I have never seen them.

Of course, old Bulletin F was supposed to be based on actual lives. They even claimed it was actual lives minus 15 percent. The studies dated from the late 1930's, and the Bulletin was put out in 1942. Who knows how they resemble actual lives now even if they were correct in the first place, which they probably were not.

The real problem is to get some reasonable hypothesis as to actual service lives. Over these you can spread depreciation by whatever spreading technique you would like. There are sources of information which have not been exploited, but they would require a research proj-

ect to get. A lot of companies, for instance, have their own assets annualized, sorted out by age of acquisition. These tabulations provide patterns of survivorship by attained age, and maybe enough of them would develop a picture you could use. I don't know. I once dreamed up a service-life distribution from Bulletin F. We tabulated more than 5,000 items of equipment, we grouped them, weighted them, and so on. We came out with an overall average of  $17\frac{1}{4}$  years, and a heavily left-skewed distribution. I don't know if that bears any resemblance to reality or not. Since Bulletin F dates from the late thirties as far as the mortality studies are concerned, I don't use my own curve any more. I don't know what resources you have for deriving valid estimates of life expectancy, but anything you can do will be to the good.

Of course there is another problem. If you use a perpetual inventory method you have the problem of adjusting for changes in average life expectancy over time. I have processed a long series of historical data with my fancy Bulletin F curve, and I can show to the fourth decimal place what percentage of today's assets are 5 years old, what percentage are 6 years old, and what percentage are 10 years old. What does it mean? I don't know. I am ashamed to use the curve because, even if the mortality distribution was right for the period when Bulletin F was made up, who knows if it is right today, 25 years later?

As for techniques, suppose you follow a perpetual-inventory calculation. You then get your survivorship by years of origin so that you can depreciate them and sum your depreciation accruals. Then you have the question of what kind of accounting structure you are going to assume. Are you assuming that all the country's assets are thrown into one big depreciation account and are depreciated at an average life-rate? Or are you going to assume that there are a lot of subaccounts in the national aggregate, that these subaccounts are separately depreciated, and that the true national accrual is the sum of the subaccount accruals? If so, what kind of subaccount structures are you going to develop?

There is another nice problem. How do you handle the problem of accounting methods? Are you going to assume, for example, that all assets in whatever subgroups you select are depreciated consistently and throughout by group accounting rules? In other words, that undepreciated balances on retirement are simply charged to reserve and not taken as a terminal deduction? If you follow item accounting rules—if you close out the items when they reach the average age assumed in the depreciation rate—you get one result; if you follow group accounting rules, another. You get a deferment of the accrual over time with the group accounting rules as compared with the item accounting rules.

The method the Department of Commerce has used is dividing assets into rather fine subclasses, figuring the depreciation accruals on each subclass with a no mortality dispersion, and then summing the accruals. How does that method compare with the one that we have used, wherein we divided the grand total of assets into service-life subgroups, using an Iowa S3 to disperse the mortalities within each subgroup? I don't know. And as a matter of fact, I would not be inclined to fight the question because if you have enough subgroups a no-dispersion assumption will give generally similar results. Who knows which is the

better technique? I should say that for practical purposes, the time required to manipulate the data might easily be controlling. While I personally prefer the use of a mortality distribution with service-life groups, you will save a lot of time by the Commerce approach.

As for the justification for the Iowa S3, you are quite right in stating that the Iowa mortality studies were made back in the thirties. It is too bad that we do not have others, but we always go back to Robley Winfrey. He has 18 types of curves, 6 symmetrical, 6 left skewed, and 6 right skewed. We classified all his mortality distributions as to which type they most nearly approach and found that if you average them, the composite is very close to the S3. Admittedly this is not conclusive for equipment because the bulk of these assets analyzed by Robley Winfrey were fixtures—public utility properties like telephone and telegraph poles, and that sort of thing. Whether his S3 is best for equipment I don't know. I am inclined to say this: It is good for the mortality dispersion of a homogeneous group of assets; that is, homogeneous as to service-life characteristics. I would not regard it as satisfactory—I think it is too peaked, as you suggest—for a composite account made up of a lot of assets with diverse service life characteristics; there you need more dispersion.

Now, as to the method of figuring the depreciation rate. I did not follow your fancy mathematics, but I will lay down a dictum that may be relevant. There are two ways of figuring the depreciation rate on a group of assets of diverse service-life composition. One is to take a weighted average of service lives (weighted by cost); the other is to divide the group into service-life subgroups, accrue straight-line depreciation on each subgroup separately, aggregate the accruals, divide into the gross account, and take the reciprocal of the quotient. That will give you an implicit service life different from the average life figured by regular method.

Which of these methods is correct? The answer is that each one is correct, but for a different type of account. If you are running out a closed account on an original group, you will come out with the right answer if you use the first method as the basis of your depreciation rate. If, however, you are running what we may call a replacement account—that is, you maintain the original service-life composition of the account by like-for-like replacement, you use the second method. This will eventually stabilize the accruals with the retirement flow.

Do you disagree with that, Bob?

WASSON. I don't quite follow you; I was not speaking from the standpoint of the amount of depreciation that should be applied into any particular account. If you want to apply the depreciation rate or the life that seems to be implicit in historical experience, one has to determine first whether the investment curve has been stable or whether it has been rising or falling. And if it has been stable there is one technique to use, that is the weighting of depreciation rates by the assets and if it has not been stable, then no matter what method you use, it will have bias, and there has to be correction of that bias.

TERBORGH. If you want to investigate our studies on the subject, I will be glad to go into them. We have confirmed the proposition that there is no right or wrong here; it is a question of the type of account involved.



I feel that somehow or other you have to set up a perpetual inventory calculation, rather than to try to figure anything from the available balance sheet and income account data. It will drive you "nuts," not simply because of the fact that we have had all kinds of depreciations over the years and the surviving assets have been subjected to varying degrees of these different kinds, but also because we have not had balance sheet data that conform to our tax data. The balance sheets tabulated by the IRS are not tax balance sheets; they are published balance sheets. A lot of big companies have double property accounts, and do not show balance sheets related to the deductions tabulated in the "Statistics of Income." You have had, in addition, many transfers of properties from the original owner, and they are not transferred at book value. They are written up or down on the transfer. There have been consolidations, mergers, bankruptcies, and what not.

I have a feeling, moreover, that there is a lot of leakage in the tabulated figures of depreciation since they do not include terminal losses taken on a bankruptcy or failure. If a company has an undepreciated balance on its books and goes into bankruptcy, they represent a capital loss. It means it did not depreciate enough in prior years, but there is no retrospective correction for prior underdepreciation. These terminal losses never get into the measurement of capital consumption. No one knows what they are, but in the aggregate they are probably quite substantial. To go back in history, the electrical interurban railroad system had depreciable assets of almost \$5 billion and in a very few years they were all gone. How much represented nonbeneficial losses?

So I would start, if I were running this, with the perpetual inventory approach. I would do the best I could to get reliable service-life estimates, fix the best writeoff techniques that I could, do everything on a consistent basis, and disregard tax statistics entirely. That, I think, would come out with a better answer.

#### FURTHER COMMENTS BY MR. WASSON

I should like to make some suggestions regarding the difference in service lives as used for tax purposes, as reflected in other public records, such as reports to stockholders or the SEC, and as actually used in business. The point of interest here does not relate to tax policy, but rather to usefulness for economic analysis. The suggestion has been made by George Terborgh that some indication of the gap between the lives used for tax purposes and those in effect in business operations might be obtained from a survey, perhaps a relatively inexpensive one. The minimum required information for any given type of asset would be (1) the value existing as of the end of a given year (e.g., 1963), including assets which may have been completely depreciated and excluded from balance sheet figures, by year of purchase, and (2) the amount originally purchased in each year. Dividing the first set of values by the second will yield percentages which can be used to build mortality tables. The data should be obtained separately for assets purchased when new and those which were used at the time of purchase. The experience of the IRS and Treasury, together with a few interviews we have had, leads me to believe that although the proportion of firms which could give the required infor-

mation is not high it is adequate, perhaps as much as 20 or 25 percent.

If successful, such a survey would not only improve our knowledge of the actual average service life of equipment and of structures, but it would also provide a better measure of the lives of specific types of equipment, and their age distribution in current stocks of capital. Significant additional and related information concerning capital, or especially data relating to capacity might be obtained as an incidental part of the survey.

The information to be obtained, in addition to the minimum stated above, would require some thought and also pilot study interviews. Both the questions and schedule design and the type and size of sample, however, would be affected by a decision as to whether the sample should be treated as an independent one, or whether the data for each firm should be related to the manner in which the firm reports to the Internal Revenue Service. I am of the opinion that the second method involves more complications, but is the only one which can yield satisfactory results with a relatively small sample. Various alternative approaches could be made, but one that I would suggest here as a basis for further discussion would involve a two stage sample, (1) an LDA type IRS study with (2) a subsample of (1) including, in addition, the questions relating to the distribution of actual assets by year of purchase and the amount of original purchases. A second and less expensive alternative would be to confine the subsample to the 1959 LDA firms, but still obtain the form 1040 schedule G data, together with any necessary supplementary information relating to those data, in addition to the survey questions. All fixed assets, including those which are amortizable (or have been completely amortized but still exist) and were excluded from the LDA study, should be covered.

It would be a mistake to assume that the tabulation of such data, and their inflation by the reciprocals of the sampling ratios, will yield the desired results. A number of adjustments might need to be made, such as those to insure that the sample is inflated to controls representing all business, including the nonrespondents and areas, such as possibly some noncorporate enterprise, not represented in the survey. In such a study, nonmanufacturing industries should be given an emphasis appropriate (though not necessarily strictly proportional) to their relative investment importance and an attempt to include at least a small segment of noncorporate business should be considered.

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APPENDIX II

REPORTS OF THE SECTOR WORKING GROUPS

- A. Federal Government
- B. State and Local Governments
- C. Households
- D. Net Foreign Claims
- E. Agriculture
- F. Natural Resources
- G. Construction
- H. Manufacturing
- J. Finance, Insurance, and Real Estate
- K. Trade
- L. Transportation
- M. Communications and Public Utilities
- N. Service Industries
- O. Nonfarm Business Financial Claims

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APPENDIX II: PART A  
REPORT OF THE WORKING GROUP ON FEDERAL  
GOVERNMENT WEALTH

Prepared by JOEL POPKIN

MEMBERSHIP OF THE WORKING GROUP ON FEDERAL GOVERNMENT  
WEALTH

- C. Robert Boucher, president, C. Robert Boucher & Co., Inc.  
Jesse Burkhead (chairman), professor of economics, Syracuse University.  
Joseph D. Cohn, Office of Management and Organization, Bureau of the Budget.  
Maynard S. Comiez, Office of Budget Review, Bureau of the Budget.  
Richard B. Goode, senior staff, the Brookings Institution.  
I. M. Labovitz, Legislative Reference Service, Library of Congress.  
Roy E. Moor, administrative assistant to Senator William Proxmire.  
Joel Popkin (secretary), Wealth Inventory Planning Study, The George Washington University.  
Peter K. Wagner, associate director, National Planning Association.  
Thomas W. Wolfe, deputy assistant to the Secretary, Treasury Department.

## PREFACE

The Working Group on Federal Government Wealth was formed as part of the Wealth Inventory Planning Study. Its purpose has been to analyse the problems connected with, and prepare proposals for, the improvement of basic data and estimates required for a comprehensive inventory of the tangible wealth and financial claims of the Federal sector.

The members would like to thank the following people who sat in on some sessions of the group and contributed to its understanding of procedures and problems associated with an inventory of wealth:

Albert C. Blanchard, Department of Defense.

Mark Crossman, Department of Defense.

Ira Hunt, Corps of Engineers.

F. C. Jameson, Department of Defense.

John W. Kendrick, Wealth Inventory Planning Study.

Nestor Terleckyj, Bureau of the Budget.

Orin E. Schuyler, Department of the Interior.

The summary of Department of Defense data and procedures was written primarily by Mr. Crossman. In addition, appreciation is due to members of the working group, Joseph Cohn and Maynard Comiez, for the special reports they prepared which have been drawn upon for the group report.

The working group held meetings on June 25, August 8, and October 10, 1963. Discussions between individual members of the working group and Wealth Study research staff members took place during fall and winter.

While this report is the responsibility of the secretary, every attempt has been made to present the consensus of the working group opinion. However, no member should be held responsible for all the views and recommendations contained in the report. Mr. Cohn has made separate comments which are at the end of this report.

JOEL POPKIN.

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## FEDERAL GOVERNMENT

### I. INTRODUCTION

There is a great need for consistently valued data on wealth—tangible and intangible—for general economic analysis. The wealth of the Federal Government is an important part of total national wealth. No wealth estimates for the United States could be considered complete without estimates for the Federal sector, prepared systematically, and consistent with those for the rest of the economy.

The group felt that in addition to the various uses of national wealth estimates by sector, it was important to consider specific uses of Federal Government wealth estimates in planning improvements of existing data. Based on group and staff discussions, some major categories of use were developed.

#### USES

Major uses of Federal Government wealth estimates can be discussed in terms of three major categories: (1) analysis of relationships of Federal to total wealth, and interregional and international structural comparisons; (2) administrative uses, as for property management, and for productivity and cost estimates and analyses; and (3) as a background for budgeting and long-range projections.

##### *Structural analysis*

Federal Government wealth is an important component of total national wealth, and its estimation is, of course, necessary for deriving aggregates. In understanding growth processes it is useful to analyze the changing relationship of Government assets, by type, to total national wealth through time. Further insight is gained by comparing levels, and changes, in public wealth ratios among regions of the Nation, and among nations. Government shares of wealth may differ considerably from shares of national income and product.

Estimates of Government wealth by region, State, and locality might be used as a basis for estimating the taxes foregone by jurisdictions due to the tax exemption accorded Federal property.

##### *Administrative uses*

The main purpose of wealth estimates is for the broader needs of general economic analysis. However, the detailed records required for such an inventory can be useful in their own right as tools in decision making. Indeed, the present GSA and DOD inventories were undoubtedly instituted to serve such needs. The requirements of the wealth inventory may serve to generate additional records which can be put to internal administrative uses. The administrative uses—actual and potential—of the records underlying a wealth inventory will be elaborated in the remainder of this section.

*Property management.*—The underlying detailed property records available in Federal agencies—particularly GSA, DOD, Interior, and Agriculture—are essential to property management. For the purchase and control of inventory stocks, officials responsible for property management must know the current levels, prices, and rates of withdrawal of the various items. The planning of maintenance and repair and additions and replacements is facilitated by knowledge of the age and condition of the fixed capital goods. Government-wide tabulation of property “excess” to each Federal agency, and then “surplus” to the Government was one of the original reasons behind congressional requests for a Federal inventory. The basic property records aid, of course, in establishing sales prices.

*Management efficiency or “productivity” studies.*—Estimates over time by an agency (or administrative units within agencies) of the real capital stock employed, in conjunction with estimates of work-unit output, yield indexes of the output-capital ratio. These ratios, and ratios of output to other inputs, particularly labor, yield valuable information concerning changes in productive efficiency of the various agencies. That is, they reveal the net savings per unit of output achieved by management through time as result of improvements in organization and technology. At the Federal level the Bureau of the Budget has completed a pilot study of productivity in five agencies (including the Post Office Department), and indications are that the techniques are applicable to many other, but not all, agencies. Some homogeneity of work-unit outputs through time is necessary for output measurement. For purpose of productivity measurement it is desirable to compute the real net capital stock, rather than to use real gross capital stock. Net capital stock can be weighted by an imputed annual interest charge to get the real service cost for the use of capital per unit of output. Real depreciation allowances may be computed on a per-unit-of-output basis directly, since this is already an annual cost for the estimated using-up of the capital. Note that capital *used* rather than *owned* is the appropriate measure. In addition to the interagency studies, comparisons of levels and changes in the productivity ratios (especially if on a detailed basis by type of input) can be used as a control by agencies (such as VA or IRS) which have a number of field offices doing similar work. While caution must be exercised in this use to take account of other variables that may differ among installations (such as size), often marked divergencies in levels or trends in the capital output or other productivity ratios raise red flags signaling the need for further investigation.

*Cost estimates.*—For purposes of overall decision-making in Government (by the Bureau of the Budget and Congress), the implicit capital charges and depreciation of fixed assets are a cost, just as are the current expenses. Obviously, in trying to determine appropriations to various agencies, a better job can be done if all costs, and where feasible unit costs, are known, and can be weighed against estimated benefits—total, or per unit. (This sort of computation is also necessary if a capital budgeting scheme were adopted.)

Present estimates of the national product originating in general government—Federal, State, and local—do not now include an allowance for the services of productive wealth, either gross (including estimated depreciation) or net (the imputed return, or capital charge).



Most economists agree in principle that such an imputation should be included in the product of the government sector and of the Nation as a whole. Certainly, public capital, as well as workers, contribute to output. Inclusion of capital services is also needed for the sake of consistency with the business sector. At the grassroots level, citizens are entitled to know what the wealth of their governmental bodies is (and implicitly the services of that wealth) since it has been created or supported through their taxes. It makes possible a more complete accounting of the services being provided by governments to the citizens and thus a better understanding by citizens of what they are buying with their taxpayments.

Estimates of capital charges are also useful in decisions as to whether to undertake certain capital outlays; the Corps of Engineers currently uses such computations. Computation of prospective annual costs, including imputed interest and depreciation, would also help in the choice of alternative weapon systems by the Department of Defense as well as in the choice of alternative capital outlays generally by the civilian agencies.

*Balance sheets.*—Preparation of Government balance sheets as part of the national economic accounts, and possibly to accompany annual budget statements of receipts and expenditures would have advantages, and, of course, requires asset estimates—financial (intangible) and real (tangible). The Federal inventory report of the House Committee on Government Operations is an approach to a balance sheet, but without the liabilities and net worth side. The financial assets and liabilities should be shown on both a combined and a consolidated basis. Over a period of years, the balance sheet and operating statement (on revenue and expenditures) would permit useful analyses as background for policy formulation and projections. Among the tools it would provide are ratios of tangible assets to debt, to financial assets, to revenue; and measures of the structure of assets, of liabilities, and of the relationship between types of assets and liabilities.

It should be emphasized, however, that fiscal policy should not be conducted with reference to the debt-asset position of the Government, but rather with primary consideration of the requirements for a sound and vigorous national economy. Like any other analytical tool, balance sheets can lend themselves to misinterpretation. The group feels strongly that their use in connection with discussions of the size of the Federal debt should be discouraged. While warning against misuse, the group generally feels that the possible constructive uses of sector balance sheets warrant their consideration.

#### *Budgeting and projections*

Knowledge of past trends and relationships for important expenditure classes provides perspective for making better budget estimates, and longer range projections.

The Budget Bureau in recent years has required 5-year expenditure projections from the various agencies, to provide a better background for current budgetmaking. Knowledge of past relations between various types of capital stocks and current output (in current prices, but preferably in constant prices) facilitates projections of capital output ratios, which in conjunction with output projections, make possible estimates of capital and net investment requirements. Net

investment plus the depreciation estimates that can be derived from the stock estimates provide an important part of total expenditure projections. Depending on the degree of detail in the investment projections, these are of use to capital goods manufacturers and construction firms in projecting their own markets, and thus their expansion plans. However, while these relationships between capital budgets and a wealth inventory are appropriate for discussion here, this discussion should not be construed as an endorsement of capital budgeting.

## II. SURVEY OF EXISTING DATA

Notable improvements in property records on the part of the General Services Administration and the Department of Defense, and the interest and direction of the Senate Appropriations Committee and the House Committee on Government Operations, are responsible for the substantial increase in the availability of data on the tangible assets of the Federal Government.

The earliest known attempt to inventory Federal real property was late in the 1930's. This inventory, prompted by a study of the effect of Federal ownership on State and local taxation, was taken as of June 30, 1937. It dealt only with Federal property in the United States, for which the inventory established a current value of \$4.7 billion and a cost in excess of \$6.1 billion. This inventory was manually prepared in large handwritten ledgers, now on file in the Archives. The summary data are published in House Document 111, 76th Congress, 1st Session, "Federal Ownership of Real Estate and Its Bearing on State and Local Taxation" (Washington: 1939).

In the early 1950's, requests for the donation of real property deactivated by the termination of World War II and the Korean war and Federal needs for space for new programs created renewed interest in property inventories. Accordingly the Senate Committee on Appropriations requested the General Services Administration to initiate a Government-wide real property inventory report. The first inventory covered only federally owned real property in the United States, as of December 31, 1953. The program has been expanded to include annual inventories as of June 30, covering all real property owned by and leased to the United States throughout the world. A comprehensive history of the real property inventory program is contained in the Senate hearings on the Supplemental Appropriations Act, 1958 (Public Law 85-170).

The first attempt to compile data on the total amount of Federal real and personal property was made by the House Committee on Government Operations. Data as of June 30, 1955, were the first published by the committee. The history, description, and objectives of this undertaking by the House committee are described in its print: "The Federal Property Inventory Undertaking of the House Committee on Government Operations" (1960). The inventory, published annually, is the most complete compilation of data on Federal Government wealth. It will be analyzed in detail in the following section of the report.

## THE FEDERAL REAL AND PERSONAL PROPERTY INVENTORY REPORT

The report of the House Committee on Government Operations, under the chairmanship of William L. Dawson, contains a consolidation of existing data and new data where gaps existed. The report is prepared pursuant to House Resolution 26, January 5, 1955. It covers Federal real and personal property, civilian and military, located in the United States, its outlying areas, and foreign countries. The report contains reprints of the inventory reports prepared by GSA and the Defense Department and some of the general-ledger-account data collected by the Treasury.

Provision for an inventory of the property of the Department of Defense—controlling agency for over two-thirds of the reported dollar value of Federal real and personal property—had been made in Public Law 216, section 410, 81st Congress. The first report of the Department of Defense under this Law to the Congress (Senate Appropriations Committee) covered real and personal property held as of December 31, 1954; to the Dawson committee, as of June 30, 1955.

The General Services Administration had authority, pursuant to the Federal Property and Administrative Services Act of 1949, to inventory the real property of the Federal Government throughout the world. The GSA has prepared these reports for December 31, 1953, and for each fiscal yearend since June 30, 1955.

The House committee obtains Government-wide data on tangible personalty and financial assets (except for 98 percent of those controlled by the DOD) from the Treasury. The Treasury, pursuant to section 114 of the Budget and Accounting Procedures Act of 1950 (31 U.S.C. 66b), began reporting data on the personalty and financial assets of Federal agencies to the Dawson committee as of June 30, 1955, and has continued to do so annually. The information for the Treasury general ledger accounts was obtained, for the fiscal 1962 yearend, from 153 agencies submitting 267 statements of financial conditions.

The combined inventory reports of GSA, DOD—including the civilian functions of the Corps of Engineers—and the Treasury accounted for \$270 billion, 90 percent of the \$299.4 billion value of Federal property on June 30, 1962, reported by the Dawson committee. This is exclusive of the donated land and public domain under control of the Department of Defense valued at \$406 million at estimated current day value.

The figures used throughout this report will be those reported by the Dawson committee. They are useful in obtaining estimates of the relative magnitudes of various sectors, although the basis of valuation is not consistent. Recommendations for improving and strengthening these estimates, including those suggested by the Dawson committee, are the subject of this report.

The remainder of Federal Government real and personal property—reported at \$29.4 billion in the Dawson report—is composed of the following items:

1. Personalty of the legislative and judicial branches collected from the relevant offices (\$2.5 billion).
2. Realty of the legislative and judicial branches reported by the Architect of the Capitol (\$0.4 billion).

3. Related investments—construction-in-progress, leasehold improvements, and real estate collateral acquired—collected by the Treasury (\$8.5 billion).

4. Realty donated or acquired at no cost to the Federal Government collected from agencies responsible for such realty (\$0.3 billion).

5. Federal public domain properties including mineral resources reported by appropriate using agencies (\$17.7 billion).

Table I shows the value of Federal property on June 30, 1962, reported to the Dawson committee, by major type for the Department of Defense, all other executive agencies and the legislature and judiciary. The basis of valuation of the various items is discussed throughout the remainder of this section.

TABLE 1.—Grand recapitulation of the personalty and realty of the U.S. Government, classified by major asset type for selected holders as of June 30, 1962

(In millions of dollars)

Holder asset type	Department of Defense	All other executive agencies, offices, and departments	Legislature and judiciary	Totals
Real property.....	\$41,473	\$17,707	\$440	\$59,620
Land donated or acquired at no cost.....	213	79	-----	292
Public domain.....	193	17,547	-----	17,740
Related realty investment.....	4,667	3,809	-----	8,476
Tangible personalty.....	127,938	26,632	78	154,648
Intangible personalty.....	3,254	53,027	12,387	58,668
Total.....	177,738	118,801	2,905	299,444

<sup>1</sup> Includes \$2,364,000, value of the collection of books, etc., of the Library of Congress. The collection is reported as "other assets" and is tabulated along with other items of intangible personalty. Because other items might be similarly classified, the distinction between tangible and intangible personalty is not as clearcut as might be inferred from the table.

Source: Prepared from data found in Federal Real and Personal Property Inventory Report, December 1962. These data are recast into more conventional form in a table in chapter 9 of the staff report.

#### THE DEPARTMENT OF DEFENSE REAL AND PERSONAL PROPERTY REPORT

The annual report on real and personal property of the Department of Defense provides summarized financial and selected quantitative data as of June 30 of the property held by the military departments and defense agencies for the military programs, property held by the Corps of Engineers for civil works, and the national industrial plant and equipment reserve in the custody of the General Services Administration.

The DOD inventory is broken down into the following major categories for which the valuation as of June 30, 1962, is given:

	<i>Billions</i>
1. Real property.....	\$35.4
2. Construction in progress.....	1.8
3. Personal property.....	127.7

#### *Realty*

The real property controlled by DOD, excluding public domain and donated lands, is valued at acquisition cost. Since February 1956, acquisition cost includes construction, including installed personal property, administrative overhead cost, and costs of Government-

furnished materials and labor. Asset-type detail consists of a breakdown of realty into the following facility classes:

	<i>Billions</i>
1. Operational and training.....	\$7.7
2. Maintenance and production.....	4.4
3. Research and development.....	1.5
4. Supply.....	3.5
5. Hospital and medical.....	.7
6. Administrative.....	1.2
7. Housing and community.....	7.3
8. Utilities and ground improvements.....	8.4
9. Real estate, land (used in connection with all of the above facility classes but not allocated to them).....	.7
<b>10. Total, June 30, 1962.....</b>	<b>35.4</b>

The annual report also provides significant category analysis of real property. Ten of these categories, which accounted for 63 percent of the real property held for military purposes on June 30, 1962, follow:

	<i>Billions</i>
1. Airfield pavements.....	\$3.2
2. Troop housing (excluding emergency housing).....	3.0
3. Family housing (excluding trailers and detached garages).....	3.0
4. Maintenance facilities.....	2.8
5. Roads and streets.....	2.1
6. Covered storage (depots and installations).....	2.0
7. Electric utilities.....	1.8
8. Production facilities.....	1.6
9. Land operational facilities.....	1.6
10. R. & D. and test facilities.....	1.5

Geographic detail by State is published in the annual report on the cost and acreage of land and improvements held for military purposes. Land and improvements outside the 50 States are broken down into two groupings—possessions, and foreign countries.

The amount, at cost, of military real property for active and inactive installations is also reported.

The rentals paid and received by the Government attendant to the leasing “in” and “out” of military real property are stated. This information is shown separately for the United States, its possessions, and foreign countries.

All information on military real property is available by individual military department—Army, Navy including the Marine Corps, and Air Force.

DOD instruction 4165.14, “Inventory of Military Real Property,” prescribes uniform procedures to be followed by the military departments for maintaining individual records of real property and the preparation of summarized reports. Codes have been established for over 100 categories of military real property, and for type of construction, ownership, and type of installation—permanent or temporary. In general, an individual priced and coded property record is maintained for each unit of real property (estimated to exceed 2 million units).

*Personal property*

Personal property as of June 30, 1962, was reported as follows:

	<i>Billions</i>
1. Equipment and supplies in supply systems.....	\$40.7
2. Property other than supply system inventories.....	87.0
(a) Weapons and other military equipment in use.....	73.8
(b) Plant equipment.....	8.4
(c) Government-furnished material.....	2.5
(d) Industrial funds.....	.3
(e) Excess, surplus, and foreign excess property inventories.....	2.0

The material in the supply systems of the military departments and defense agencies consists of materials, supplies, and equipment to support the U.S. forces. Of the total equipment and supplies in the supply system—\$40.7 billion as of June 30, 1962—stock fund inventories accounted for \$6.2 billion, appropriated fund inventories, for \$34.5 billion. Stock fund inventories are priced at a standard price reflecting the current procurement or production costs, plus a surcharge for transportation and a surcharge for foreseeable normal stock losses. Appropriation-financed inventories are priced in the same manner except that no surcharge for loss is included. Standard prices of supply system inventories are reviewed at least annually to determine if a price revision is required. Inventories are reported by approximately 100 supply management groups into which the 4.6 million line items in the supply systems fall. Inventories are reported by major material category, classified by purpose for which held (strata). Certain low value items are excluded from financial reporting although accounted for in quantitative terms.

Weapons and other military equipment in use with organizational units include ships, aircraft, and missiles which account for the high cost reported for this category—\$73.8 billion. This type of property is reported by broad asset classes and the military department using the weapons and equipment. Accountability is maintained for all weapons and equipment until worn out, lost, destroyed, or otherwise disposed of. The book value of ships is stated on the basis of construction costs. Aircraft and missiles are priced at the average procurement "flyaway cost" for the entire production over the life of the type, model, and series of the item. Items such as rifles, radios, and vehicles are priced at the inventory standard price.

Plant equipment consists of machinery, equipment, furniture, vehicles, machine tools and accessory and auxiliary items, excluding special tooling, used in the manufacture of supplies or performance of services. Such equipment is utilized by military installations and defense contractors or held in departmental industrial equipment or other reserves. If in inventory, plant equipment is priced at standard prices reflecting current procurement costs. No surcharges for losses or transportation are included in prices. Plant equipment acquired directly for use is priced at acquisition cost. The annual report reflects the amount of plant equipment by various types—production equipment, metalworking, and other plant equipment—for each military department. High costs metalworking equipment amounting to

\$2.5 billion is reported in detail by age for each Federal supply classification and department. Data currently omitted from reports are the amounts of Government-furnished scientific equipment (plant equipment) in the hands of universities conducting federally financed research.

Inventories held in industrial funds consist of raw materials, supplies, and work in progress required for the manufacturing, assembly, or repair processes of industrially funded activities. These are priced at acquisition cost.

Excess, surplus, and foreign excess property (including scrap and salvage) consists of those materials, supplies, and equipment in the hands of property disposal offices for screening for further use in the Government or in the process of sale or other disposition. It is valued at the price at which transferred from inventory at the time of transfer to disposal. The amounts held by military departments and defense agencies in the United States, its possessions and foreign countries are stated in the annual report.

Government-furnished material consists of equipment, materials, and supplies which have been purchased by defense contracting officers and furnished to defense contractors for incorporation in a final product being produced for the Department of Defense.

#### *Civil works property*

The amount of personal and real property held for the Civil Works Division of the Corps of Engineers, Department of the Army, is stated in the annual report as of June 30, 1962, as follows:

	<i>Billions</i>
Real property-----	\$6.0
Construction in progress-----	2.9
Personal property-----	.2

This property is held for civil functions such as harbor and flood control.

#### *National industrial plant and equipment reserve*

As of June 30, 1962, the GSA maintained 12 manufacturing and processing plants in the national industrial plant reserve. Ten of these plants have been sold with recapture clauses, and two have been leased to private concerns.

As of June 30, 1962, GSA also maintained a national industrial equipment reserve of over 9,000 items of metalworking machinery and production equipment, which originally cost \$91.8 million. These plants and equipments are available to Defense upon request and justification of their use.

#### THE GENERAL SERVICES ADMINISTRATION INVENTORY REPORT

Summary data based on the GSA annual inventory of Federal property are contained in "Inventory Report on Real Property Owned by the United States Throughout the World." Some of the tables found in this document are reprinted in the report of the Dawson committee.

The GSA real property inventory totals are supported by detailed reports submitted for each of the 15,335 Federal installations by agency, located in the United States, outlying areas and foreign countries. This figure excludes Department of Defense military installations located outside of the 50 States for which only summary cost data are reported to GSA.

For each reporting installation detailed information is collected on GSA form 1166. These data are transferred to punch cards and reproduced on detailed inventory listings. The following information is collected by GSA on form 1166:

1. Name and location—State, county, and city; country if foreign.
2. Land:

(a) Classification—predominant use segregated into the following classifications for which data on the acquisition cost of land located in the United States, in millions of dollars, as of June 30, 1962, are given:

(1) Flood control and navigation.....	\$1,394
(2) Military (except airfields).....	360
(3) Office building locations.....	307
(4) Airfields.....	252
(5) Reclamation and irrigation.....	235
(6) Forest and wildlife.....	206
(7) Industrial.....	159
(8) Power development and distribution.....	158
(9) Parks and historic sites.....	150
(10) Institutional.....	60
(11) Research and development.....	36
(12) Storage.....	32
(13) Harbor and port terminals.....	24
(14) Grazing.....	21
(15) Military functions in Alaska and Hawaii.....	20
(16) Vacant.....	17
(17) Housing.....	1
(18) Agriculture.....	1
(19) Other land uses.....	29

(b) Acreage—rural and urban.

(c) Method of acquisition—public domain, purchase, donation, exchange, long-term interest.

(d) Date of acquisition.

(e) Cost to the Federal Government including additional costs incurred in purchasing and preparing the land for use—no cost is reported for land held in trust, reserved and unreserved public domain, and land donated for historical sites.

3. Buildings—completed and available for service:

(a) Classification—predominant use segregated into the following for which data on acquisition cost of buildings located in the United States, in millions of dollars, as of June 30, 1962, are given:

(1) Housing.....	\$4,651
(2) Service.....	3,970
(3) Industrial.....	2,896
(4) Office.....	2,597
(5) Storage.....	1,973
(6) Research and development.....	1,842
(7) Hospital.....	1,347
(8) Military functions in Alaska and Hawaii.....	1,277
(9) School.....	793
(10) Prison.....	226
(11) Other institutional uses.....	226
(12) Other usages.....	298



- (b) Number of buildings.
- (c) Date acquired.
- (d) Gross floor area—except for buildings held in trust.
- (e) Percent of floor space occupied—except for buildings held in trust.
- (f) Cost to the Federal Government excluding the cost of buildings held in trust and including all expenditures required to adapt the building to its used and subsequent capital improvements.

4. Other structures and facilities:

(a) Classification—predominant use segregated into the following categories for which data on acquisition cost of structures and facilities located in the United States, in millions of dollars, as of June 30, 1962, are given:

(1) Utility systems.....	\$4, 812
(2) Flood control and navigation.....	3, 957
(3) Power development and distribution.....	3, 946
(4) Roads and bridges.....	2, 715
(5) Airfield pavement.....	2, 147
(6) Reclamation and irrigation.....	1, 769
(7) Miscellaneous military facilities.....	1, 535
(8) Military functions in Alaska and Hawaii.....	1, 302
(9) Storage.....	1, 054
(10) Service.....	905
(11) Harbor and port facilities.....	680
(12) Railroads.....	597
(13) Research and development.....	536
(14) Communication systems.....	293
(15) Industrial.....	151
(16) Navigation and traffic aids.....	160
(17) Monument and memorials.....	31
(18) Other usages.....	456

(b) Cost to the Federal Government—except the cost of buildings held in trust and including all expenditures required to adapt the building to its use and subsequent capital improvements.

Once an installation has submitted the above data on GSA form 1163 it must file a new report only when changes of \$1,000 or more have occurred in the previously reported holdings. The changes may be the result of a new acquisition, omission, transfer in, disposal, transfer out, or revision and are so categorized. The year-to-year changes in the property holdings of installations controlled by each agency—the level at which reports are made to GSA—are summarized by the respective agencies on GSA form 1209, submitted as of the end of each fiscal year. The details of the year-end realty inventory are consolidated for each agency on GSA form 745 which is submitted annually. A special feature of this report is a column where portions of realty which have been declared excess to the needs of agencies may be shown. The Department of Defense follows a different procedure in reporting to GSA. It submits a complete inventory annually rather than reporting changes.

The total cost of realty and acres of land of the Department of Defense, given in the GSA inventory is less than those reported by DOD, to the Dawson committee. The excesses of DOD figures over those of GSA are 8,189,430 acres for land and \$135 million for reproducible realty. A reconciliation of the difference, prepared by DOD, appears in the Dawson committee report. For land, GSA acreage figures do not include easements, temporary use permits, leases, foreign base rights, public lands, land under the Pentagon, and "adjustment." (However, the Pentagon—land and building—is included as an asset of GSA in the governmentwide inventory.) For the value of reproducible realty, GSA figures do not include the cost of the

Pentagon, leasehold improvements and land acquisition rights and "adjustments." GSA figures include the value of donated properties which are not included by the Department of Defense.

#### TREASURY DATA ON PERSONALTY

The Treasury Department collects general ledger information on realty and on the personalty of the agencies, departments, and offices of the executive branch. The Treasury collection excludes the majority (98 percent) of Department of Defense personalty, except for financial assets (\$3.3 billion on June 30, 1962). Most of the data are collected quarterly on standard form 220—Statement of Financial Condition. The form is a balance sheet accounting for assets, liabilities, and net investment. The asset accounts, excluding land, buildings, structures and facilities, leasehold improvements and accumulated depreciation (for Federal enterprises), are incorporated in the report of the Dawson committee. The accounts which appear in the committee report, their dollar values, and valuation bases, as of June 30, 1962, follow:

1. Cash on hand, in banks, and in transit, \$11.2 billion (actual value).
2. Investments, \$5.7 billion (par value adjusted for discounts and premiums).
3. Accounts and notes receivable, \$4.5 billion (actual value).
4. Commodities for sale, etc., \$4.7 billion.
5. Work in process, \$0.7 billion.
6. Materials and supplies, \$9.2 billion (acquisition cost).
7. Loans receivable, \$26.9 billion (actual value).
8. Machinery and equipment, \$12.2 billion (acquisition cost).
9. Other assets,<sup>1</sup> \$10.3 billion.

#### INFORMATION ON OTHER ASSETS

Aside from data on Federal realty and personalty provided the Dawson committee by GSA, DOD, and the Treasury, there are other data which round out the report of the committee.

Data on the realty and personalty of the legislative and judicial branches are collected from the appropriate offices. Realty data for these branches are collected from the report of the Architect of the Capitol to the Dawson committee.

The personalty of these branches is reported in original cost. Detail by asset-type is extensive, covering a wide range of items. The value of the personalty reported, however, is small relative to the Federal sector as a whole.

Realty of the legislative and judicial branches under control and care of the Architect of the Capitol is reported by building at acquisition cost and for the aggregates of "land" and "building and improvements" at estimated present-day value.

The Dawson committee gets general ledger data from the Treasury on worldwide related realty investment. Such investment, consisting of construction in progress, leasehold improvements, and acquired real estate collateral, totaled \$8.5 billion on June 30, 1962. Of the total,

<sup>1</sup> Includes \$2.8 billion, the dollar equivalent of U.S. holdings of foreign currency; \$2.4 billion, the book collection and equipment of the Library of Congress; and \$2.5 billion, miscellaneous financial assets of the Department of Defense, including cash in the hands of disbursing officers. This category is a mixture of tangibles and intangibles. Because it is felt that other tangibles, aside from those of the Library of Congress, are, also, included in it, no attempt has been made to revise the accounts.

construction in progress accounts for 81 percent. Almost two-thirds of total construction in progress is attributed to the Department of Defense, particularly the Civil Works Division of the Corps of Engineers. Totals for the Department of Defense (including the Corps of Engineers) are reported in the DOD inventory report discussed above. Data on construction in progress are available only from these sources, since GSA does not add a building to its inventory until it is ready for use.

The remaining categories—leasehold improvements and acquired real estate collateral—consist mainly of holdings in the latter category by the Veterans' Administration and the Housing and Home Finance Agency.

Information on all three categories of related investment for the executive branch (other than DOD) is obtained from the Treasury through its form 220. Construction in progress and leasehold improvements are valued at cost. Acquired real estate collateral is accounted for at the value of the unpaid claim in most cases.

Federal realty donated or acquired at no cost to the Government which was previously recorded at zero cost or \$1 is now requested by the Dawson committee on an "estimated present-day value" basis. Seventy-three percent of the estimated value figure of \$292.2 million as of June 30, 1962 is attributable to holdings of the Department of Defense; 17 percent to holdings of the Department of the Interior.

Department of Defense's donated land is valued either at the installation level, using locally available information, or at higher levels, using data on trends in land values. The Department of the Interior values donated lands by procedures similar to those it uses to value public domain, described below.

Information on the estimated present-day value of land in this category is submitted directly to the Dawson committee by the controlling agencies. This land is also reported to GSA on its form 1166. The GSA regulation, however, requires that donated land and land acquired at no cost be valued at what it would have cost the Federal Government at the time of acquisition.

Detail on number of acres, agency, and State is given in the Dawson committee report. Since this land is also reported to GSA, the detail on form 1166 is most likely also available.

The final section of the Dawson committee report covers public domain acreage including mineral resources. Based on estimated present-day valuation, the value of public domain acreage is \$12.3 billion, and mineral resources, \$5.4 billion, as of June 30, 1962.

Of the \$12.3 billion estimated present-day value of public domain, \$6.5 billion is attributable to the Agriculture Department and \$5.5 billion to the Interior Department. Together these two Departments account for 97 percent of both the acreage and the value of public domain land.

The Department of Agriculture's totals include public domain land and timber. Excluded are the values of minerals and such items as water production. The valuation is in terms of "commercial values," based on the selling price of comparable adjoining property or broad classes where the former is not available. Information on the selling price of products of the land (especially timber) or fees paid to use the land (viz, grazing land) is also used, either directly or through capitalization formulas.

The Department of the Interior total is based on estimated "commercial value" also. Information on the selling prices of comparable land and revenue accruing to the Government because of these land holdings is used to establish the value.

The average per-acre value of public domain land as reported to the Dawson committee was \$17.06 on June 30, 1962. The average per-acre value varied widely by State and controlling agency.

Mineral resources, all of which are administered by the Department of Interior, are classified into two groups for valuation purposes. The first group consists of all mineral resources located in the States, valued at \$2.2 billion as of June 30, 1962. The present value of such resources is found by discounting at 4 percent, a 50-year income stream estimated by taking into account present receipts from mineral leases, licenses and permits, probably future production, and demand factors. An exception to this is the value of Minnesota copper and nickel deposits which is calculated by discounting at 4 percent, an estimated income flow over 25 years, deferred 25 years from the date of the estimate.

The value of oil and gas deposits in the Outer Continental Shelf, the second group, is based on a preliminary estimate subject to revision based on production experience, litigation, and technological change.

#### LEASED ASSETS

The General Services Administration prepares "An Inventory Report on Real Property Leased to the United States Throughout the World." The report is prepared pursuant to the Federal Property and Administrative Services Act of 1949 as amended. The report as of June 30, 1962, is the 7th annual compilation in the series.

The reporting unit for this survey is every lease calling for rental payments at an annual rate of \$2,000 or more (\$500 for leases involving land only). Groups of leased assets which total to the required figure may be aggregated and reported if all of the property involved is in the same "major" city, same State, or same outlying area of the United States or foreign country. When this is done, however, the leasing agency must still keep detailed records on each lease.

Rents are reported on an "annual rate basis." They totaled \$221 million for fiscal 1962. The terms of the lease are also reported. The rental payments are not broken down by category of leased asset. Floor space and acres leased are requested, however, by major use category. GSA publishes these totals for the United States for 11 classes of buildings.

Information on rentals paid for machinery and equipment is scanty. Data are available for rented and leased automatic data processing equipment and motor vehicles, presumably the two most important categories of assets leased "in." The Bureau of the Budget has pre-

pared a study for the Subcommittee on Census and Government Statistics of the House Committee on Post Office and Civil Service entitled "Inventory of Automatic Data Processing (ADP) Equipment in the Federal Government" (Washington: 1963). This document contains a complete listing of all ADP equipment in the executive branch except that which is used in military operations and certain other activities within DOD. Summary data on rentals paid for several past years together with projected outlays through fiscal 1966 appear in the document. In fiscal 1962 rentals paid by the Federal Government for computers and punched card equipment totaled \$179 billion.

The Motor Equipment Management Division of GSA published detailed data on the use of motor vehicles by the Federal Government. These data for fiscal 1962 are found in its "Annual Motor Vehicle Report." The report for fiscal 1962 was published in January 1963. The report indicates that during fiscal 1962 a cost of \$5.6 million was incurred in connection with vehicles leased by the Government. This figure includes the total of rental payment and fuel, maintenance and repair costs. The present reporting system does not permit the separation of rental payments.

Since the data on rentals paid for real property are on an "annual rate" basis while those on rental payments for ADP equipment are on an "actual outlay" basis, they cannot be added.

The rents received by the Federal Government for real and personal property are reported among receipt items in the Treasury Bulletin and totaled \$86 million for fiscal 1962. Twelve million dollars of the total was received for the leasing of real property of the Department of Defense; this figure is contained in the Department of Defense inventory report.

Form 1166 provides some basis for identifying the buildings leased out. If an installation's real property, in any particular category (such as "office" buildings), is completely leased out, the installation reports OL (out-leased) in the column headed "percent occupied." If that item included 10 office buildings, 1 of which was out-leased, the installation would report 90 percent in the "percent occupied" column. (This assumes all buildings have the same floor space and the nine used by the Government are 100-percent occupied which might not be the case.) In a footnote to form 1166 the leasing of the one building would be indicated. Information contained in these foot notes is not tabulated.

#### TREASURY FINANCIAL ASSET DATA

Data on the financial assets of the Federal Government are collected by the Treasury on the same form (220) used to obtain general ledger information on personalty. The financial assets accounts, together

with their dollar values (in millions) as of June 30, 1962, obtained from the Treasury Bulletin of November 1962 (p. 94), follow:

(1) Cash in banks, on hand, and in transit.....	\$454
(2) Fund balances with U.S. Treasury.....	16,362
(3) Public debt securities (par value).....	1,530
(4) Securities of Government enterprises.....	128
(5) Unamortized premium or discount (—).....	—11
(6) Other securities.....	5,562
(7) Advances to contractors and agents:	
Government agencies.....	46
Other.....	141
(8) Accounts and note receivable:	
Government agencies.....	2,179
Other (net).....	4,259
(9) Accrued interest receivable:	
On public debt securities.....	6
On securities of Government enterprises.....	317
Other.....	569
(10) Loans receivable:	
Government agencies.....	135
U.S. dollar loans.....	24,858
Foreign currency loans.....	2,943
Allowance for losses (—).....	—758
(11) Foreign currencies.....	2,807

These data do not coincide with those reported to the Dawson committee which are found above (see p. 21). The discrepancy is due, in part, to the fact that the Treasury Bulletin data are on a combined basis, while those reported to the Dawson committee are consolidated. Also the coverage differs for each purpose.

Detailed data on the public debt and other liabilities also exist.

#### TREASURY DATA ON INVENTORIES

The Treasury also collects (on form 220) data on inventories by stage of process—finished goods, work in process, and materials and supplies. Inventories as of June 30, 1962, less allowances for losses, totaled \$19.9 billion. No valuation instructions are given in the instructions for completing form 220.

### III. DISCUSSION OF THE EXISTING DATA

#### GAPS AND OVERLAPS IN THE DATA AND ITS COLLECTION

It is likely that there still are items appropriate for inclusion in the inventory of Federal realty which have not been picked up due to incomplete property records or to the fact that some assets are not under inventory accounting control. For most of the tangible personalty, only general ledger account information exists; there is no systematic underlying inventory. Presumably, some inventory records are behind the dollar amounts reported to the Treasury but the extent to which these exist has not been studied. The need for broadening the scope of the collection process has been underscored by the Dawson committee in the introduction to its report for fiscal 1962. An analysis of the existing data indicates that progress has been made in this direction.

There are some overlapping vehicles for the reporting of wealth data. However, where these exist, the overlapping provides two or more different presentations of the same body of data. While this is

not necessary for a wealth inventory, the reports serve other purposes. An example is the collection of realty figures by both Treasury and GSA. The latter compilation is used by the Dawson committee while the former is collected as part of the Treasury's financial accounting responsibility and offers different detail. The Department of Defense reports its realty to both the Dawson committee and GSA; the breakdowns differ between the two reports.

GSA does not collect data on the value of leasehold improvements and land acquisition rights; it receives reports on donated land and land acquired at "no" cost based on the estimated value at time of acquisition, rather than the estimated present-day value requested by the Dawson committee.

#### DETAIL BY ASSET TYPE

Realty, including that of the Department of Defense, has been cast by GSA into asset-type categories. Realty is placed in appropriate GSA categories based on its predominate use; therefore, the figures shown for each category are not precise (the categories and their dollar magnitudes are given above).

Construction-in-progress, leasehold improvements and land acquisition rights are not broken down into the applicable asset categories, however. The data are taken from general ledger accounts with no underlying detail.

The estimated current-day values of public domain land, donated land and land acquired at no cost to the Federal Government are not broken down into these categories either; figures on the acquisition cost and acreage are broken down by asset category.

The realty of the judiciary and legislature is specifically enumerated and could readily be distributed among the existing GSA asset-type categories.

The dollar value of personalty of executive agencies, departments, and offices, except the Defense Department, reported to the Treasury, is not classified into separate categories within the machinery and equipment groupings. Furthermore, the Treasury total for "other assets" includes tangible and intangible personalty. Personalty of the Department of Defense is broken into classifications applicable to the Defense Establishment. Some equipment classes, however, such as plant equipment, would be applicable throughout the Federal Government. Personalty of the judiciary and legislature has been enumerated and could be allocated among appropriate classifications.

Detail by asset-type is the same for both the domestic and oversea property of the Federal Government except for certain instances in the Department of Defense inventory where oversea detail is not published for security reasons. The data are available for property management within the Department of Defense.

#### DETAIL BY REGION

Data on Federal real property for the most part can be broken down by county since the basic information is obtained by GSA at the installation level. Problems do arise, however, in regard to any installations which encompass more than one county in a State since such in-

installations report only the names of the counties and need not allocate their assets among them. Where an installation encompasses two or more States, separate asset reports must be submitted, each covering the portion of the installation's realty located in each State. Where an installation's realty is all in one county, it may be further identified by city or town when such identification is applicable.

Generally, the Department of Defense also maintains realty records on an installation basis which would yield data on the distribution by county. This information, in the realty area, is called for in the report submitted to GSA by the Defense Department.

Personalty data, collected by Treasury and the Department of Defense, are not broken down by area. Financial assets and transportation equipment, such as the automobile fleet and merchant marine of the nondefense sector and military carriers, would not meaningfully fit into regional asset accounts, but other tangibles could be so classed.

The realty and personalty of the judiciary and legislature are specifically enumerated and could be readily allocated by area. The acreage figures on land donated or acquired at no cost to the Federal Government and public domain lands are broken down on the same basis as other realty covered in the GSA report. However, the present-day value estimates for this acreage are not summarized by State.

#### DETAIL BY FUNCTIONAL USE

All Federal realty and personalty is broken down on a broad functional use basis. The functional use categories are the same as those employed by the Bureau of the Budget for classifying expenditures except that the category "interest," a flow, is not applicable to assets. The functional use categories, together with the value reported for each as of June 30, 1963, are presented in table 2.

TABLE 2.—Grand recapitulation of the personalty and realty of the U.S. Government, classified on a functional use basis as of June 30, 1962

[In millions of dollars]		June 30, 1962
<i>Major function and class</i>		
<b>National defense:</b>		
Personal property:		
Intangible assets.....		\$916.
Tangible assets.....		143, 875
Real property:		
Land and improvements.....		41, 207
Public domain.....		206
Total.....		<u>186, 204</u>
<b>International affairs and finance:</b>		
Personal property:		
Intangible assets.....		20, 190
Tangible assets.....		139
Real property:		
Land and improvements.....		276
Public domain.....		-----
Total.....		<u>20, 605</u>



TABLE 2.—Grand recapitulation of the personalty and realty of the U.S. Government, classified on a functional use basis as of June 30, 1962—Con.

<i>Major functions and class</i>	[In millions of dollars]	<i>June 30, 1962</i>
<b>Space research and technology :</b>		
Personal property :		
Intangible assets.....		\$9
Tangible assets.....		212
Real property.....		739
Total.....		<u>960</u>
<b>Agriculture and agricultural resources :</b>		
Personal property :		
Intangible assets.....		6,912
Tangible assets.....		5,205
Real property.....		90
Total.....		<u>12,207</u>
<b>Natural resources :</b>		
Personal property :		
Intangible assets.....		440
Tangible assets.....		1,368
Real property :		
Land and improvements.....		18,560
Public domain (including mineral resources).....		17,522
Total.....		<u>37,890</u>
<b>Commerce and transportation :</b>		
Personal property :		
Intangible assets.....		1,092
Tangible assets.....		6,200
Real property :		
Land and improvements.....		2,250
Public domain.....		7
Total.....		<u>9,549</u>
<b>Housing and community development :</b>		
Personal property :		
Intangible assets.....		4,316
Tangible assets.....		338
Real property.....		512
Total.....		<u>5,166</u>
<b>Health, labor, and welfare :</b>		
Personal property :		
Intangible assets.....		3
Tangible assets.....		341
Real property :		
Land and improvements.....		234
Public domain.....		(1)
Total.....		<u>578</u>

<sup>1</sup> Less than \$500,000.

TABLE 2.—Grand recapitulation of the personalty and realty of the U.S. Government, classified on a functional use basis as of June 30, 1962—Con.

Major functions and class	[In millions of dollars]	June 30, 1962
<b>Education:</b>		
Personal property:		
Intangible assets.....		\$1, 403
Tangible assets.....		2, 399
Real property.....		116
Total.....		<u>3, 918</u>
<b>Veterans' benefits and services:</b>		
Personal property:		
Intangible assets.....		1, 859
Tangible assets.....		306
Real property:		
Land and improvements.....		1, 651
Public domain.....		2
Total.....		<u>3, 818</u>
<b>General government:</b>		
Personal property:		
Intangible assets.....		15, 158
Tangible assets.....		635
Real property:		
Land and improvements.....		2, 753
Public domain.....		3
Total.....		<u>18, 549</u>
<b>Summary:</b>		
Personal property: <sup>2</sup>		
Intangible assets.....		52, 298
Tangible assets.....		161, 018
Real property:		
Land improvements.....		68, 388
Public domain.....		17, 740
Grand total.....		<u>299, 444</u>

<sup>2</sup> The totals for tangibles and intangibles in the summary and component function are not exact because the "other assets" account, included above with intangible personalty, contains some tangibles, notably the collection of the Library of Congress.

Source: "Federal Real and Personal Property Report," December 1962, pp. 14 and 15.

The totals by functional use are computed for the Dawson committee by the Treasury. The method used is to allocate the assets of each bureau according to the "account" code given for the bureau by the Bureau of the Budget. The accounts are coded by functional use. In some cases, more than one account code is applicable to a bureau. When this occurs, all of the tangible assets of that bureau are put into the most important (largest expenditures) functional class. The resulting inaccuracy stems from the fact that installations do not report any functional breakdown of their assets. Unless this were done, inaccuracies would be present in the data.

In addition, there is some question as to the fineness with which functional use lines can be drawn. Can a line realistically be drawn as to whether a particular asset is properly classified in "Space re-

search and technology" or "National defense"? Perhaps problems of this sort are not pervasive enough to provide any significant distortions of the data, but they do deserve mention.

#### DETAIL BY CONTROLLING AGENCY

The reports on realty and personalty are submitted to GSA and the Treasury by each agency so detail by agency is a natural consequence.

In addition, the buildings and structures and facilities of the large agencies are broken down by bureau (military department and defense agency in the case of Department of Defense). The figures for each bureau are subdivided by location—United States, outlying areas, and foreign countries.

#### LEASED ASSETS

The GSA report on real property leased to the Federal Government, does not indicate the value of the assets leased. However, information on the value of the assets presumably would be obtained only from the lessor.

The survey is broad, and covers individually, all leases calling for rent, on an annual rate basis, of \$2,000 or more (\$500 or more for leases covering land only).

Rental payments are not clasified by asset type. However, since leases calling for rental payments at an annual rate of \$2,000 or more are reported separately, such a breakdown might be obtainable for a substantial number of leased assets. Problems could arise as a result of a single lease, calling for rent in excess of \$2,000, which covered two or more types of tangibles such as a school with research and development facilities. However, the rental payment could be allocated between these two use categories based on the square feet of floor space allotted to each use.

Except in the cases of automatic data processing equipment and motor vehicles, there is no indication of the payments for machinery and equipment leased to the Government.

Statements of Federal receipts published by the Treasury, indicate the rents received by the Federal Government. In some cases, the real property leased out by the Government, can be identified from form 1166. They are not tabulated, however.

If the rentals paid for realty by the Federal Government during fiscal 1962 were capitalized at a 10 percent rate, their value would be \$2.2 billion, 3.7 percent of value of federally owned realty on June 30, 1962. Federal agencies are generally not permitted to lease assets the annual rental for which exceeds 15 percent of the cost of purchase, so the 10 percent assumed capitalization rate may not be too far from reality. When the total assets leased by the manufacturing sector during 1957—latest information available—are valued by capitalizing the rental payment for that year at 10 percent, the resulting figure is \$14.1 billion or 13 percent of the gross book value of manufacturers' depreciable assets on December 31, 1957. The 3.7 and 13 percent are not comparable because the former applies only to realty, the latter to all fixed assets. However, a very high rate of machinery and equipment rental by the Federal Government would be needed to bring the

percentage at all near that of the manufacturing sector. Computer rentals, \$179 million in fiscal 1962, if capitalized at 10 percent, would increase leased assets by \$1.8 to \$4 billion, 2 percent of the realty and tangible personalty of the Federal Government.

If rentals received by the Federal Government during fiscal 1962 were capitalized at 10 percent, the leased assets would be valued at \$860 million. (The values of assets leased "in" and "out" are not comparable due to differences in the methods of computing rents paid and rents received.)

In addition to their relative unimportance in the Federal sector, leased assets are difficult to identify and value. Unless an arbitrary capitalization procedure, like that employed above, is used, it is impossible to establish the value of assets leased "in" without questioning the lessor. If the capitalization method is to be applied nonetheless, other difficulties arise. Leases vary in the degree of repair and maintenance to be performed by the lessee and that to be performed by the lessor, the cost of which would presumably be included in the rental payment. In many cases, land and improvements are leased as a unit for which one rental is paid; this would create an allocation problem if detail by asset type were to be collected. Some Federal rental payments include subsidies, especially in connection with assets leased from foreign countries.

#### VALUATION METHODS

There are four basic methods of valuation reflected in the figure of \$299.4 billion reported by the Dawson committee as the value of Federal realty and personalty on June 30, 1962. Historical cost data are available for real property and principal personalty in the inventory. Standard pricing, reflecting replacement cost is the basis for valuation of stock and appropriated fund inventories of the Department of Defense. Realty under the jurisdiction of the Architect of the Capitol is valued at replacement cost. Present-day value estimates have been made for public domain and land donated or acquired at no cost to the Federal Government. These estimates have been based primarily on the commercial value of similar land in the proximity of the land to be valued. Mineral resources have been valued by capitalizing expected future income streams from their sale. The tangible-asset classifications, which reflect current-day values in some form together with construction in progress, account for 22 percent of the \$299.4 billion total value of Federal property as of June 30, 1962 reported by the Dawson committee.

The goals of the Dawson committee, established as a result of hearings and discussions with valuation specialists over the past few years, are to adopt "estimated replacement cost less estimated depreciation" as the valuation yardstick for buildings and structures; and, to value land, which is theoretically considered to be irreplaceable and non-depreciable, and mineral resources at prices reflecting current market value. The committee decided to accept valuations of personalty at acquisition cost because of the relatively short life of the tangibles and the work which would be needed to revalue the large number of items involved. Nevertheless, the inconsistency of original cost and present-day valuations is apparent.

The use of the "estimated replacement cost" basis obviates the necessity of answering an important question in assigning values to Federal properties: Shall such properties be priced based on the stream of products and services they produce when owned by the Federal Government or on the value of such properties if they were converted to use by the private sector? The former basis is probably more appropriate but is not generally feasible because the established values would be purely subjective in most cases. The latter basis would yield a more objective measurement standard, but because of the special nature of Federal Government assets, federally owned and operated facilities valuable to the Nation might have little value if transferred to the private sector. Because replacement cost calculations are based on the value of inputs, they are independent of use or value of output. (However, the value of total input per unit of output is equal to the price of a unit of output, including normal profit, under conditions of perfect competition in the long run with perfect foresight). Where replacement cost cannot be used as in the case of land, the question of which use—public or private—should be the basis for valuation remains. The Dawson committee concluded that pricing in such cases should be based on the "commercial value" of comparable assets in the private sector.

The Department of the Interior has conducted a pilot study on present-day valuation methods at the request of the Dawson committee, which approved the guidelines established for the study. The pilot study used the GSA collection vehicle (form 1166), amended to ask for estimated current-day values instead of cost. The amended form was requested as of June 30, 1962, from all Interior installations located in the States of Washington, Oregon, and Idaho. Excluded were the public domain lands and trust properties of the Bureau of Indian Affairs, but not the improvements thereon. Realty was broken down into three categories. The definitions of these categories and the valuation methods used for each are given below:

1. Land value based on recent selling prices of comparable properties, or the capitalization, at currently relevant interest rates and periods of years, of rents received for use of the land or prices received for products of the land.

2. Nondepreciable properties—those structures and improvements which "(1) are generally considered inherently unmarketable and for which no market data are available on which to base current-day values, (2) because of increased current-day construction costs have not lessened in value, and (3) have not materially deteriorated since date of acquisition or completion of construction," valued at acquisition or construction cost, actual or estimated if unknown, to the Federal Government.

3. Depreciable properties—buildings, structures, and improvements which "(1) are generally considered marketable and/or for which market data are available on which to base current day values and/or (2) have depreciated in value since date of acquisition or construction due to deterioration, obsolescence, etc.;" valued at estimated "reproduction" (sic) cost less depreciation.

The conceptual framework of the pilot study only partially meets the Dawson committee's purpose in requesting it because of the inclusion of the "nondepreciable property" category. Fifty-six percent of

the assets surveyed fell into this classification. The justification for the use of this category seems to be that for many assets estimated replacement cost less depreciation is about equal to acquisition cost; therefore, the data collection effort could be reduced. However, only the second condition for the nondepreciable category relates to this justification. The third condition amends the second by requiring that an asset cannot be considered "nondepreciable" if it has "materially deteriorated," even if the amount of deterioration (depreciation) is offset by the increased cost of replacing that portion of the asset which is undepreciated. The first condition—lack of market data—presents a totally different constraint. This constraint would be desirable if the pilot study procedure required that assets be valued at market prices. However, a replacement cost estimate need not be justified on the basis of marketability since there still may be the need to replace an unmarketable asset.

Therefore, if the goal of the committee is estimated replacement cost less depreciation, only the second condition is necessary to get the desired figure. Furthermore, strictly speaking, replacement cost must be estimated to insure that the second condition is met.

The value of assets on June 30, 1962, calculated in accordance with the requirements of the pilot study, showed an increase of 5.8 percent over the acquisition cost figures reported to the Dawson committee for the same date. While this increase is relatively small, it should be pointed out that the excess of estimated present-day value over acquisition cost for buildings and structures and facilities was 8.2 percent. For land, present day value was 39 percent less than cost.

The 5.8 percent aggregative difference, therefore, tends to conceal interesting changes in the components. Furthermore, the 8.2 percent excess of present-day value over acquisition cost for buildings and structures and facilities obviously does not take into account differences in these values for the tangible assets excluded from the survey.

A further gage against which to measure the validity of the present-day value estimates obtained in the Department of the Interior pilot study are the replacement cost estimates employed by the Department of the Army for internal planning purposes. The method used to make these estimates involves computing the average unit cost of replacing principal items of real property at current prices. The average unit costs are adjusted by an index computed to reflect the degree to which regional costs vary from a benchmark area at a certain point in time. Such indexes have been developed when needed by the Department of the Army and when no better data has been available. Thus, national average cost after adjustment for regional differences, could be directly applied to the physical data to obtain replacement costs by region. Estimates based on this method indicate that, currently, replacement cost estimates are about three times the acquisition cost, which seems somewhat high. If current replacement cost per unit estimates for barracks, for example, include recreational rooms which were not part of original facilities, the Department of the Army estimates of replacement cost would be overstated. Price indexes are usually adjusted for these differences but are not adjusted for quality changes.

The Department of the Interior study adds little to an assessment of the feasibility of the valuation goal of the Dawson committee—"esti-

mated replacement cost less depreciation." It does point out one important fact, however: When shortcuts are employed (such as establishing a nondepreciable category which need be valued at book cost only) the resulting estimates suffer.

On the other hand, the expenditure of large amounts of funds to achieve a high degree of precision in the estimates is not desirable or necessary. It was estimated by Mr. Hardy W. Jacobs, NAI, chief of real estate appraisal for the Corps of Engineers that it would cost \$17 million and take 2 years to place current-day values on realty of the Department of the Army if detailed appraisal techniques, including on-site inspection, were used. Army realty, including civil works of the Corps of Engineers, is located at 2,527 installations throughout the 50 States and embraces 17.2 million acres of land with 184,021 buildings containing 863 million square feet of enclosed area. This realty, except for public domain and donated land was valued at \$15.7 billion, based on acquisition cost on June 30, 1962. Thus, appraisal costs are about one-tenth of 1 percent of the cost of the realty involved. This compares with the \$4,255 and 1,043 man-hours needed to complete the pilot study of the Department of the Interior which covered realty with a book value of \$1.414 billion, equal to a cost of three one-thousandths of 1 percent of acquisition cost.

#### DEPRECIATION

The asset values reported by the Dawson committee are gross of depreciation. Depreciation is calculated only by Federal business-like enterprises, but is not netted against the gross figures these enterprises report to GSA and the Treasury.

Depreciation may result from use of the asset, from idleness which causes deterioration, or from obsolescence. For many physical assets, particularly the military hardware of the Department of Defense, depreciation may be retarded or prevented entirely, by expenditures which preserve the value of the asset. However, all of these expenditures cannot properly be termed "repair and maintenance" which is an "expensable" item. The line between "repair and maintenance" and major part replacements which should be capitalized rather than expensed is difficult to draw. Existing tax laws provide some basis for making the distinction. However, they are largely inapplicable to Department of Defense property.

In this connection consider an army tank as an example. This vehicle may be at 100 percent of its operational efficiency despite its age and use. However, perhaps only the shell represents original equipment; the original components may have been completely replaced. The question of what percent of the expenditures represent "normal" maintenance and repair and what percent represents the replacement of parts which were "fully depreciated" is difficult to answer. (Items which fall into the latter group should of course, be capitalized.)

The Department of Defense, for planning purposes has established a guideline for realty which acknowledges the difference between normal repair and maintenance and the replacement of physical capital. Thus paragraph III, A, 5, g, (2) of "Department of Defense Instruction: Inventory of Military Property" (No. 4165.14 dated Feb. 20, 1958)

provides, in connection with the determination of whether a facility is usable or not, that :

N (Unusable)—indicates the condition of a facility which is presently un-serviceable and has deteriorated beyond economical restoration or constitutes a danger to the health or safety of personnel, or to equipment housed therein. It also includes facilities which are presently being used but for which the annual maintenance cost is in excess of 20 percent of the current replacement cost.

This directive acknowledges that depreciation is an on-going process, but, in essence, provides that it only be taken into account when that depreciation has reached a certain point.

For many types of military plant and equipment obsolescence is a more important factor than physical depreciation. Technological change may substantially, if not fully, diminish the usefulness of a piece of equipment even though the equipment is still fully capable of performing the mission for which it was designed. Furthermore, because of its special function, the equipment may not have an alternative use. It is impossible to determine obsolescence in advance; it is only measurable after it has occurred. But past experience furnishes a guideline to the future.

Since the depreciation on most federally owned property is not calculated, the figures contained in the Dawson committee report are largely "gross." (If the rise in the replacement cost of these assets just offset their loss in value due to depreciation, the current replacement-cost value would be given by coincidence.)

For those Federal enterprises which record depreciation, the depreciation reserves averaged 17 percent of the gross depreciable asset account on June 30, 1962. For TVA it was 22 percent, compared with 20 percent for the 225 largest privately owned electrical utilities. This difference probably does not indicate differences in useful life estimates between comparable private and public activities; if differences exist, however, they should be reconciled.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

The working group recognizes the important advances in property accounting made by the General Services Administration and the Department of Defense and in the collection and reporting of balance-sheet data by the Treasury. The direction given by these departments and the cooperation of the individual respondent agencies have contributed significantly to the excellent framework which currently exists for obtaining wealth data and current-day value estimates.

The working group likewise recognizes the value of the important steps taken by Congress generally, and by the House Committee on Government Operations in particular, to support and encourage the inventory of Federal Government assets, to compile the data in a single, accessible report, and to stress the need for estimating current-day values of realty.

The recommendations of this group are not directed specifically to the House committee, although the committee may wish to take cognizance of some of these recommendations. The Federal Real and Personal Property Inventory Report is designed for particular uses, whereas the Wealth Inventory Planning Study is looking toward eventual wealth statements and finally balance sheets for the Federal Government as part of the national economic accounts, broadly con-



ceived. Thus, the concern here is with the sorts of basic data required for this broad purpose, and with significant aspects of the final estimates obtained. The recommendations relate to the agencies collecting and assembling the basic asset data for the Federal sector, and to the statistical agency that might be called upon at a later stage to process the data into balance sheet and wealth estimates.

The recommendations which will be discussed in detail below refer both to conceptual issues and statistical problems of making the actual estimates. The conceptual matters include those of defining the sector and determining the valuation appropriate for the various types of capital stocks. The statistical problems include the additional data which must be collected, the amount of detail in which estimates should be published, and the information which the agency processing wealth data will have to obtain, through pilot studies and feasibility tests, in order to transform the raw data into final estimates. The distinction between the additional data which must be collected and the task of processing the wealth data is important. Obviously much of the burden of providing data to fill current gaps will fall on the agencies holding the relevant tangible assets, although sampling techniques and other methods are recommended for use wherever possible to reduce this burden. On the other hand, responsibility for revaluing the basic data to appropriate current-day values rests with the agency that would be called upon to prepare wealth estimates for the economy as a whole.

While the recommendations of the working group are discussed fully in the remainder of this report, the major ones can be summarized here. Overall, the working group recommends that wealth estimates, reflecting current-day values, be prepared for the Federal sector on both a use and ownership basis, in appropriate detail by agency, functional use, geographical area and asset type. To achieve these objectives, three additional major bodies of data are required to supplement the data which are currently available. First, there is need for an inventory of personalty, similar to that now conducted by GSA for realty, probably on a one-time basis. Second, additional inquiries on rents paid should be added to the current GSA inventory of assets leased by the Government. Third, selected age data for federally owned tangibles should be obtained on a sample basis. The fulfillment of these three requirements will call for the cooperation of the responding agencies. The transformation of these data to current values would be the responsibility of the agency designed to prepare estimates. This agency would conduct special studies designed to determine lengths of life of various depreciable asset types and their associated depreciation curves. Also, it would explore the methods of valuation for certain inventories, such as those of the CCC, and examine and determine the adequacy of price indexes needed for revaluation. Other programs needed to prepare the estimates, including tabulation and publication, would be its responsibility. Thus, there would be no need for reporting agencies to change their accounting or property management techniques to reflect current-day values or depreciation.

In addition to the recommendations relating to filling data gaps and valuation, the group has made recommendations concerning appropriate detail—by agency, functional use, geographic area and asset

type. The working group mainly favors detail consistent with that obtained for the rest of the economy, so that geographical and asset type totals can be shown across sectors. In many cases, as indicated, detail on Federal Government tangibles is more than adequate; in others the working group has recommended feasibility tests to see if more detail can be gotten.

The full set of working group recommendations are set forth and elaborated in the remainder of the report.

#### SCOPE OF THE FEDERAL GOVERNMENT

##### *By agency*

Generally speaking, the scope of the Federal sector should include all organizational units whose programs or activities are substantially formulated and administered by Federal agencies or appointees. Mere financial contribution or support is not a sufficient criterion, by itself for including a unit in the Federal sector. Within the sector, the assets of Federal corporations and agencies conducting business-type activities, as defined by the Department of Commerce for purposes of national income accounting, should be shown separately from those for "general government."

The above definition would exclude from the Federal sector all additions to State, local, and private assets such as highways, hospitals, public works, merchant ships and schools, that are financed with Federal funds, but over which the Government does not have significant control. It would include certain retirement and social insurance trust funds (excluding the unemployment trust fund) whose assets are administered by the Federal Government. It would also include the Federal Reserve System and the five Government-sponsored enterprises which, even though they are more independent of Federal control than the regular Federal agencies, are, nonetheless, Federal Government instrumentalities responsible for carrying out public policies. The wealth of such organizations should be shown separately from other agencies of the Government. The definition would include assets in the form of library, museum, and art collections, whether owned directly by the Federal Government or by its agencies serving as trustees. It would not, however, include art collections or other assets loaned to Federal Government agencies by non-Federal owners. Assets in the form of loans made by other sectors of the economy but guaranteed by the Federal Government should be included in those sectors which made the resource allocation. The foregoing examples are not intended to be exhaustive but are cited to indicate the manner in which the general definition is to be applied.

##### *By type of property*

The wealth inventory should cover the realty, personalty and financial assets of the Federal sector. It is recommended that the terms "realty" and "personalty" be supplemented by the major categories of "land," "mineral resources," "buildings," "structures and facilities," "machinery and equipment," "inventories," and "financial assets." These classifications would serve to distinguish between reproducible and nonreproducible assets, real and financial assets, depletable and depreciable assets.

The value of easements and rights-of-way held by the Federal Government should be included as they are currently. However, since they are essentially claims, they should be included with intangibles. A study might be made of the feasibility of getting additional detail on these assets. The value of the underlying property rights should, of course, be reported and allocated to the owning sector. This raises the question of whether the values reported by the owning sector take into account the reduction (or increase) in the value of the underlying property because of the easement.

Leasehold improvements should be included, as is currently done, with assets owned by the Federal Government; this treatment is valid if it is assumed that improvements will be fully depreciated at the time the lease or easement expires. This assumption may result in inaccuracies but these may be offset by the added work which would be involved in allocating improvements to leaseholds and easements among the sectors owning the underlying property.

#### *By location*

The inventory of Federal property should continue to include that held in outlying areas and foreign countries as well as in the 50 States. Holdings in outlying areas and foreign countries should be separately identified and segregated by country, as they are now. (A country classification may not be feasible for certain property of the Department of Defense for security reasons.) Domestic realty should be tabulated by county, the geographical basis on which most property is currently reported to GSA, thus permitting various regional as well as State groupings. A feasibility study should be made to see if regional detail for tangible personalty—machinery and equipment and inventories—is meaningful despite the portability of the assets involved.

#### *By functional use*

Detail by the broad functional use categories of the Bureau of the Budget should be maintained. Such detail is useful not only in the Federal budgetary process but for general analytical work as well. Assets are presently allocated among functions by predominant use at the bureau level. The working group recognizes that these categories are designed to present a general picture and cannot be meaningfully made more precise for several reasons. First, an asset which is used in more than one functional use category at any level—agency, bureau, or installation—cannot precisely be allocated among them, while it can be classified according to its predominant functional use. Second, the functional use categories cannot be cast into clear-cut classes. Difficulty is inherent, for example, in trying to classify some assets as being used either for “national defense” or “space research and technology.” Third, functional use categories will change over time with shifts in the role of the Federal Government and the needs of the Nation.

#### DATA REPORTING AND COLLECTION

The group endorses the basic reporting systems developed by GSA for real property, by the DOD for its real and personal property, and by the Treasury Department for financial assets and liabilities. The use of the “installation” as the basic unit by GSA permits the collection of considerable detail from underlying property records and,

through the county coding system, permits the tabulation of real property data by regions. On the other hand, it is appropriate to collect financial data by those agency organizations and funds with separate accounts as the Treasury does currently; any further break would be artificial—just as in the business economy, financial claims data are obtained by company, while tangible assets may be obtained by establishment or plant.

To supplement the present system, however, a reporting system should be devised to facilitate a more useful inventory of tangible personalty recommended elsewhere in the section. This is not to suggest that the Treasury Department drop the tangible asset items from its "Statement of Financial Condition." Rather, the need is for greater detail for all tangibles, which can best be obtained by extending the scope of the GSA-type survey to include machinery, equipment, and inventories as well as real property. The "tangible" classification, which is of great significance in wealth estimation, cuts across the conventional "realty" and "personalty" classifications now underlying the reporting systems.

#### DETAIL BY ASSET TYPE

The classifications which are used by GSA to delineate the various types of land, buildings, and structures and facilities should be maintained. Mineral resources should be shown separately. In addition, asset classifications should be established for machinery and equipment and inventories. The primary objective of the classification should be to reflect the major types of tangible personalty used by the Government. A pilot study, possibly to be undertaken by GSA, would be required to determine the major types of nonmilitary equipment in the possession of Federal agencies. If possible, these should be grouped by the categories used in the gross national product estimates for "producers of durable equipment," or by combinations of these categories. However, when necessary for achieving the objectives of the overall Wealth Study, additional classifications should be established. Thus, it may be necessary to show separately the stock of transportation, construction, communication, and power-producing equipment, which might be a small percentage of total Federal property, in order to allow the national stock of such classes of equipment to be measured.

Classification for the machinery and equipment of the Department of Defense, currently in use, are appropriate to maintain, since these assets are usually quite different from those used in other sectors of the economy. Where it is relevant and practical, however, Department of Defense machinery and equipment which falls into the asset categories established for the rest of the sectors should be reclassified into those categories by the agency processing wealth data.

#### DETAIL BY REGION

Current practices of the GSA enable it to classify the real property reported to it by county for the most part. This basis of reporting should be continued. If a feasibility study so indicates, this classification should be extended to tangible personalty. The regional coding system used by GSA should be adopted generally since it would facili-

tate the handling of the data and insure uniform reporting. For Federal property located outside the 50 States, the current country breakdown is recommended.

It is necessary to exempt the Department of Defense from reporting weapon data by counties, and by country, because of security considerations.

Where the assets of an installation encompass more than one county in a State, a method should be devised by the agency preparing wealth estimates to permit the allocation of these assets among the counties.

#### LEASED ASSETS

In order to properly identify the assets responsible for output of goods and services in the Federal sector, assets leased to and by the Federal Government should be enumerated. This would make it possible to adjust the stock of federally owned assets to arrive at the value of assets actually used in the Federal sector. However, because of the difficulties associated with valuing leased assets, especially those leased "in" and their relative unimportance in the Federal sector, the approach should be broad.

These estimates of leased assets would permit leasing in the Federal sector to be dovetailed into data on leased assets in the other sectors for which it will be collected. For this purpose, it is recommended that data on rental payments by asset type be collected. (See above for a discussion of asset types.) It is also suggested that more data on out-leased assets, by type, be obtained by GSA on form 1166, if it is determined that this is feasible.

#### VALUATION

In view of the objectives of the Wealth Study as a whole, the group agrees in principle with the desirability of working toward some type of current or present-day values for Federal tangible assets—land, buildings and structures, machinery and equipment, and inventories. In the first place, current values make it possible to compare wealth across sector lines, as well as across agency or functional lines within the Government sector. Second, current valuations of capital goods yield consistency among vintages, and provide meaning in terms of future productive capacity.

The majority of the group feels that it is highly desirable to revalue machinery and equipment as well as structures to a replacement cost basis to provide consistency, but realizes that it may not be feasible for the former, due to the many individual items involved. A minority of the working group does not favor revaluation of machinery and equipment on the grounds that they have shorter lives than plant, so that use of original cost involves less distortion relative to current values. However, the reasonableness of collecting sample data needed to revalue machinery and equipment should be explored.

It should be generally understood that the group does not advocate changing basic agency accounting procedures. Rather, in the case of fixed reproducible assets, the collecting agency would obtain the basic data needed for revaluation—data by type, by age, as discussed below—on a sample basis from existing agency records.

The majority of the group favors the estimation of stocks of depreciable assets net, as well as gross, of depreciation. Others feel that depreciation has less relevance to public assets than to business assets, especially in the category of weaponry. Those who favor the estimation of depreciation also advocate obtaining length-of-life information, except for weaponry, as well as relevant price series for revaluation purposes, by the estimating agency.

The working group strongly endorses the use of sampling techniques as a vehicle for arriving at the valuation bases recommended above. Sampling techniques have proven to be highly useful in statistical estimation. These methods should be applied whenever the cost of collecting—on a census basis—the data necessary for revaluation is deemed too high.

#### *Land*

The current value of land can be measured in a number of ways. The Public Lands Subgroup of the Natural Resources Working Group has recommended the establishment of regional appraisal boards.

The establishment of valuation guidelines for appraisal boards or other valuation units requires further investigation. One method should be devised for each type of land with a view toward consistent valuation among the controlling agencies. The method or methods recommended will govern the data collection and processing procedures. If the information required for valuation varies widely by type of land, or requires specific knowledge obtainable only at the controlling agency level, or requires information not readily transmitted as part of the overall data collection process, valuation might have to take place at the agency or perhaps installation level. In that event, the valuation technique must be one which insures consistency in interpretation and usage. Otherwise, it would be preferable to devise generalized valuation guidelines which could be employed, together with a simple body of data collected from each controlling agency, by the regional appraisal boards.

For continuing wealth estimates beyond the benchmark inventory the formula adopted for valuing land would have to be applied every year. This requirement should also enter into the selection of the method. One way of handling the problem would be to construct appropriate price indexes for broad categories of land, using sample data, which would be used to bring benchmark current-day values up to date.

#### *Buildings, structures, and facilities*

Buildings, structures, and facilities should be valued at replacement cost, gross, and net of depreciation, particularly in view of the long lives of most of this type of capital. Such revaluation is properly the task of the agency processing wealth data. Historical cost figures offer no basis for comparison—intertemporal or spatial—although they do furnish the basis for revaluation. Market values would be difficult to find in the case of many Federal buildings, and would pose the problem of value to the private versus the public sector. Capitalizing expected benefits would involve too much subjectivity. If the asset is useful to the needs of the Federal sector, then replacement cost would indicate the size of the expenditure

required to continue the stream of goods or services the asset had been producing.

Replacement cost estimates could be made by a data-processing unit if it had available figures on historical cost and age and an appropriate price index. The only additional piece of information required to accomplish the replacement cost valuation would be an amendment to the reporting requirement on age. This amendment could be incorporated on a sample basis only. Currently, installations may, and do, report assets aggregated by type on each line of GSA form 1166. Thus, an installation may report all of its office buildings on the appropriate line and give the total acquisition cost for the category as a whole. Under "dates acquired," the report may state a period of years (often lengthy) over which these "office" buildings were obtained. Separate reports for each "office" building would increase substantially both the number of line items required of respondents and the processing task of the collection agency. As a compromise, it is recommended that total cost for each structural type of asset be reported by groups of years. Capitalized improvements to a reproducible asset, subsequent to its acquisition, should be reported by groups of years during which the improvements were made.

One basis for grouping years, which should be explored, would be to isolate periods, if existent, during which the trends in the prices of an asset group were similar; i.e., perhaps the office building price index increased about  $x$  percent per year in each year between 19 $y$  and 19 $z$ . This method would tend to minimize the errors resulting from averaging yearly price indexes. Another possibility would be to center groups of years on periods, if existent, when expenditures on this type of asset were larger than usual. Regardless of the method adopted, the group feels that where expediency so dictates, sampling techniques should be used, and will yield results just as acceptable as other methods.

An alternative method of arriving at replacement cost, suitable only for property measurable in a standardized physical unit, is that used by the Department of the Army. This method, described more fully above, requires that the current cost of constructing a physical unit (viz, a square foot, for buildings) be determined by type of asset and multiplied by the number of units in existence for each. This method has disadvantages, however, if depreciation is to be computed. (The recommendations on depreciation appear below.) Also, it may be difficult to find enough physical common denominators for the varied physical assets of the Federal Government, especially assets other than buildings.

#### *Machinery and equipment*

A majority of the working group feels that a "one-time" inventory required to get information on the dates or periods of acquisition and types of machinery and equipment necessary to revalue these assets, is worthwhile. Some members of the group, however, oppose assigning replacement cost or any other current-day value to machinery and equipment.

The arguments for replacement cost computations, made by the wealth-data-processing agency, follow. Machinery and equipment owned by the Federal sector could be compared with other Federal

holdings and similar holdings of the private sector. Sufficient information on asset-type and useful lives could be gathered from a "one-time" inventory to enable the agency preparing the wealth data to keep estimates up to date using only flow data. The information on age and equipment type could conceivably be of use in property management and market demand analysis.

The minority view is that the difference between replacement cost (especially depreciated replacement cost) and original cost is not significant because of the short lives of the items involved. Furthermore, it is argued that the information on replacement cost would not have uses commensurate with its cost in terms of the burden placed on the respondent.

To reduce the burden on the respondent, the practice used by the Defense Department might be followed. This practice is to exclude from the inventory all machinery and equipment items below a certain value. A special study should be made to determine the extent of the inaccuracies in the wealth estimates introduced by use of this procedure and also, concurrently, to determine the cutoff value, if any. In addition, the fact that approximately 29 percent of the value of Federal machinery and equipment on June 30, 1962, primarily that under the control of the Department of Defense, did reflect current values reduces the task even further.

A desirable format for the basic inventory of machinery and equipment would be parallel to that employed by GSA in 1954-55 for real property, but with the modification suggested above to show cost by groups of years of acquisition for each type. Following the basic inventory (to be accomplished by 1970), annual reports of additions or retirements would keep the inventory up to date. An assumption that retirements were always of the oldest vintage, necessary to maintain a running picture of age-composition, may not generally be correct. This suggests the need for periodic inventories, possibly once a decade. While this would be the desirable procedure, sampling techniques, discussed above, could be substituted, if necessary.

#### *Price indexes*

Studies should be made by the agency processing wealth data to determine the extent to which currently available price indexes for the private sector are applicable to the Federal sector, in view of the probability of differences in the product mix between the two sectors. Special indexes should be constructed where existing ones prove to be inadequate.

#### *Depreciation*

It is recommended that the agency processing wealth data compile capital stock estimates both gross and net of depreciation. However, it is not recommended that depreciation be calculated for weaponry of the Department of Defense. This means that only gross stock figures, not net stock, will be available for the economy as a whole.

The concept of depreciation is widely recognized by economists and businessmen. A proper estimate of business costs must include depreciation and the imputed interest on depreciated capital stock. Such computations are necessary in projections used to choose among alternative investments.



Federal Government accounting practices do not recognize depreciation except for Federal enterprises. For purposes of consistency with wealth estimates for the private sector, depreciation on Federal property should be computed. This calculation would be made by the unit making the wealth estimates, because Federal operational organizations would not have the information needed to calculate depreciation; nor is it recommended that existing Federal accounting practices in regard to depreciation be altered.

The calculation of depreciation would require no additional information other than that required to compute replacement cost—book cost figures and groups of years of acquisition. This information, together with the results of studies to be made to determine the useful lives of various types of property, would be sufficient to make the depreciation calculation. Where Federal property has counterparts in the private sector, the results of studies of useful lives in the private sector could be applied. For property peculiar to the Federal sector, whether because of its type or the use to which it is put, additional useful life studies would have to be made by the unit preparing the wealth estimates.

Some members of the group stressed the fact that many types of military equipment are maintained at 100 percent of operational efficiency. Furthermore, in many instances they are maintained in this state of readiness even after they are made obsolete by newly designed equipment; they are used either for training purposes or as reserves.

Other members felt that this view fails to give consideration to the repair and maintenance expenditures which properly should be capitalized in keeping equipment at 100 percent of operational efficiency, and to the probable increase in legitimate maintenance costs with time. It was also felt that technological advance is a potent force causing the relative service value of aging weapons to decline.

### *Inventories*

Inventories should be valued at current prices. For many types of inventories, book value is close to current market and is acceptable. Inventories held by the Commodity Credit Corporation and stockpiles of strategic materials are examples of holdings which do not reflect current-market value. Special studies are recommended to determine the current-day values of these types of stocks.

### FINANCIAL ASSETS

The working group recommends that data on the financial assets and liabilities of the Federal Government, together with data on tangible wealth, be cast into balance sheet form. The Group recommends this presentation so that the data on the Federal sector can be linked to data on other sectors of the economy for which balance sheets will be constructed. The group does not feel, however, that a Federal balance sheet has any analytical role in discussions of the size of the Federal debt and use for that purpose is to be discouraged.

Detail on financial assets by type should conform to those recommended for use in the private sector by the Financial Claims Working Group. The accounts provided for on form 220 by the Treasury appear to be flexible enough to recast along private sector lines. If not,

some accounts on form 220 will have to be broken down. At the time that the coverage by agency of form 220 was increased to comply with the Dawson committee's request for asset data, liability information was not required of the additional agencies which then had to report. Information on the liabilities of these agencies should be collected.

Financial assets and liabilities should be shown for the same agencies for which tangible asset data are to be shown. It is recommended that they be shown both gross and net of interagency claims, as they are on form 220.

The financial assets of Federal Government trust funds, mainly Federal Government securities, should be shown separately. The liabilities of these funds to the household sector are difficult to measure and subject to change by law.

Most financial assets and liabilities can be valued at the amount at which they are carried on the books. For some Federal claims on foreigners, such as soft currency loans, valuations are much more difficult. The recommendations of the Working Group on Net Foreign Claims should be followed in instances such as these.

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SUPPLEMENTAL STATEMENT BY JOSEPH D. COHN

EXECUTIVE OFFICE OF THE PRESIDENT,  
BUREAU OF THE BUDGET,

*Washington, D.C., February 25, 1964.*

MR. JOEL POPKIN,  
*Secretary, Working Group on Federal Government Wealth, Wealth Inventory Planning Study, George Washington University, Washington, D.C.*

DEAR JOEL: I have reviewed the draft report of the Working Group on Federal Government Wealth and attached are a few comments and suggestions which you may wish to consider in any further drafting and editing of the final report.

As you know, I have serious reservations concerning the usefulness from an operating and program standpoint of a current value inventory of Federal real and personal property. I am also concerned about the cost of such an effort. I will not presume to influence the group's conclusions on this point since I realize its objectives involve the need for economic indexes which I am not qualified to evaluate fully. I will not object to this feature of the report so long as it is understood clearly that my role in the group was primarily that of a technical adviser on the availability and reliability of data on real and personal property.

Sincerely,

JOSEPH D. COHN,  
*Management Analyst, Property and Supply Management Branch,  
Office of Management and Organization, Bureau of the  
Budget.*

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APPENDIX II: PART B

REPORT OF THE WORKING GROUP ON STATE AND  
LOCAL GOVERNMENT WEALTH

Prepared by ERIN M. WOODALL

MEMBERSHIP OF THE WORKING GROUP ON STATE AND LOCAL  
GOVERNMENT WEALTH

- George A. Bell, Budget and Management Division, State of Vermont.  
James W. Bibb, State Budget Officer, State of Kansas.  
Laslo Ecker-Racz, Commission on Intergovernmental Relations.  
Jean Flanigan, Research Division, National Education Association  
of America.  
I. M. Labovitz, Legislative Reference Service, Library of Congress.  
Allen D. Manvel, Governments Division, Bureau of the Census.  
Roy E. Moor, Joint Economic Committee, U.S. Congress.  
Dick Netzer, Graduate School of Public Administration, New York  
University.  
Edward Nowak, Finance Department, city of Detroit.  
Joel Popkin, Wealth Inventory Planning Study, The George Wash-  
ington University.  
Alice Rivlin, Brookings Institution.  
A. M. Woodruff (chairman), School of Government, Business, Inter-  
ior Affairs, The George Washington University.  
Erin M. Woodall (secretary), School of Government, Business, In-  
terior Affairs, The George Washington University.

## PREFACE

Meetings of the Working Group on State and Local Government Wealth were held on July 23 and September 30, 1963. This report attempts to reflect the consensus of the group, but no member should be held responsible for all the views expressed therein. All the members of the working group, except Mr. Moor, reviewed a preliminary draft of the report and were free to submit supplementary statements for inclusion in the final report to clarify their individual views if they so desired. However, sole responsibility for the final wording of the report rests with the secretary.

The secretary wishes to acknowledge the assistance of John W. Kendrick and Joel Popkin in the preparation of this report.

ERIN M. WOODALL.

## STATE AND LOCAL GOVERNMENTS

### I. SCOPE OF STATE AND LOCAL GOVERNMENT SECTOR

The definition of governments used by the Bureau of the Census in its census of governments reports was adopted by the working group to delineate the scope of its sector. According to this definition, State and local governments include the governments of the 50 States and those of cities, counties, townships, school districts, and special districts, as well as the departments, boards, commissions, and other organizational units of these governments which are subject to their administrative and fiscal control through the appointment of officers, determination of budgets, approval of plans, and other devices.

As thus comprehensively defined, the State and local government sector is not limited to agencies or activities which are tax supported but includes, in addition, public agencies which engage in selling goods or services to the public. Census Bureau reports distinguish five kinds of such enterprises from the "general government" category: Alcoholic beverage stores, and local utilities providing water supply, electric power, transit, and gas supply services. Other activities of State and local governments which involve sizable amounts of revenue from charges or which are quasi-commercial in nature include: The dormitories and other auxiliary activities of public colleges; public housing projects; publicly operated hospitals; port facilities; airports; ferries; and toll roads and bridges. Under the proposed definition, all such agencies and activities would be included in a wealth inventory of State and local government; none would be omitted merely on the basis of its resemblance to nongovernmental enterprises, or its self-supporting nature.

Adoption of this definition throughout the inventory would prevent duplication of the assets of business-type government enterprises.

### II. SPECIAL USES OF STATE AND LOCAL GOVERNMENT WEALTH DATA

Property accounting historically has had a low priority in State and local government circles. In spite of this, the working group believes that the respondent governments would find the data produced by a wealth inventory useful for internal management purposes. A better knowledge of the functional and geographic distribution of existing assets, for example, would facilitate the making of capital budget decisions. An accounting of changes in capital stock in the government sector would also be helpful in connection with productivity analysis.

Published data on State and local government finances compare revenues with expenditures in dollar terms but are not related to assets. An inventory of State and local government assets would indicate the magnitude of public investment within the sector. Taxpayers, armed with information on what their tax dollars are buying, would

be able more intelligently to influence decisions regarding government acquisition of additional assets.

In the realm of public education, an inventory of public school assets would provide valuable information on the status of facilities in the various school districts and make it possible to set regional, State, and local school district norms. This information also would be useful for the evaluation of school management practices, such as the accumulation of current funds for capital outlays, and the planning of future investments in educational facilities.

An inventory of State and local government wealth with detail on the composition and the functional and geographic distribution of government property would enable planners and public officials to determine the comparative level of public facilities and thus better assess public accomplishments and needs. This information also would greatly facilitate capital improvements program planning in the public sector.

Lastly, such an inventory is an essential part of a system of national wealth estimates.

### III. SUMMARY REVIEW OF AVAILABLE DATA ON STATE AND LOCAL GOVERNMENT WEALTH

This review indicates most, though not necessarily all, of the kinds of information on the intangible and tangible assets of State and local governments which have been collected and published. Information on the financial assets of State and local governments has been gathered by the Bureau of the Census but no such comprehensive body of data on the tangible assets exist. A few Federal agencies administering Federal aid programs in certain functional areas, such as education and highways, and related organizations in other areas have assembled some data on the tangible assets of State and local governments in their particular spheres of interest, but the completeness of the data varies substantially.

#### BUREAU OF THE CENSUS SURVEYS

The Bureau of the Census regularly assembles comprehensive data on the financial assets of State and local governments, and has done so annually since 1952. These figures are based upon substantially 100 percent coverage for census of governments years; i.e., 1957, 1962, etc. For other years, the data include sample-based estimates for local governments along with State government figures based on complete enumeration. The 1961 local government estimates were computed on the basis of a sample of 10,000 local governments out of a U.S. total of 90,000 such units and included all 310 cities with populations of 50,000 or more, all special districts with a debt in excess of \$1 million in 1957, and all of the larger local government units in each of the 50 States. Of these included in the sample, approximately 90 percent actually responded to the mail questionnaire.

The Census Bureau data are available in relatively summary form by States but in greater detail nationally, by level of government. For example, financial holdings are classified by type of fund :

- Employee retirement.
- Unemployment compensation.
- Other insurance trust funds.
- Debt offsets.
- Bond funds.
- All other funds.

Cross classification is provided by type of asset :

- Cash on hand and on deposit.
- Federal Government securities.
- State and local government securities.
- Nongovernmental securities.

A further breakdown for the nongovernmental securities by type is also developed regularly for the retirement system, which accounts for the bulk of all such State-local holdings.

Some background information for measuring the tangible assets of State and local governments is available from Census Bureau statistics on State and local government expenditures, especially their capital outlays. These data are developed annually in terms of amounts spent in the categories of new construction, equipment, and land and existing structures, cross-classified by function and by level of government. Local government data consist of sample-based estimates except for census of governments years. National totals with detail by type, by function, and by levels of government are available on a consistent basis for each year since 1952. Capital outlay statistics for individual States with less detail have been compiled annually since 1957. Summary national totals by level of government also are available for selected earlier years back to 1902. These data include an undetermined amount of spending for expendible items used in connection with capital investments.

#### OFFICE OF EDUCATION SURVEYS OF SCHOOL PROPERTY

The U.S. Office of Education compiles data on the value of elementary and secondary school property in the public school system on the basis of reports submitted by State departments of education. States are requested to report the original cost of school property plus the cost of all additions and alterations, but are permitted to report replacement cost or insurance coverage figures if original cost data are not available. Hence, data from individual States are not always comparable. Biennial Surveys of Education in the United States between 1929-30 and 1950-51 gave totals by State. Subsequent surveys include additional detail by State in three categories of property, i.e., sites, buildings, and equipment, but not for every State. Thirty-seven States and the District of Columbia reported property values for their public school systems in the 1959-60 survey but several of these reported the total of site and buildings values only and two others reported estimates of the aggregate value of school property only. A list of the major categories of wealth data included in the property



accounting system recommended for public school systems by the U.S. Office of Education is found in annex A of this report.

Similar data on the property of publicly controlled institutions of higher learning are available in the Biennial Survey of Education in the United States. These data are based on a comprehensive survey of all such institutions. Response to a 1957-58 questionnaire represented 93.6 percent of the entire group. The value of tangible assets was reported by State in the categories of land, buildings, improvements other than buildings, and equipment. These surveys also give amounts of intangible assets by State including dollar amounts of plant funds added during the year, and of plant fund liabilities at the end of the year.

A 1962 National Inventory of School Facilities conducted in conjunction with a civil defense survey of shelter facilities provides information on the total number of instructional rooms in public school systems by State with detail on the number of rooms in nonpermanent buildings, offsite facilities, and in permanent buildings.

A further breakdown of instructional rooms in permanent buildings shows the number of rooms completed prior to and after 1920 cross-classified by combustibility characteristics.

Some jurisdictional problems complicate the collection of wealth data in public school districts. Legally independent districts maintain separate property records, but the property records for legally dependent school districts are kept by the county or municipality and may not be kept separate from other local government records. In addition, there are some school districts, primarily in the South, which are legally independent except for ownership of property whose property records are an integral part of the records of the respective local governments concerned.

#### BUREAU OF PUBLIC ROADS

Data on the physical volume of State and local highways and the cost of selected portions of these highway systems are assembled annually by the Bureau of Public Roads in the report, "Highway Statistics." This report contains a complete inventory of road and street mileage by State, classified by the level of government responsible for it. Additional detail on the type of system and type of surface is given for State-administered highways. Data on the physical volume of all new construction are available, but cost data are available only for those portions built under contract by State highway departments or administered by State agencies. Expenditures of State or quasi-State toll authorities which are administered separately are not included.

Certain inconsistencies in reporting road mileage distort these statistics. Some State highway departments report additional mileage when new lanes are added to existing routes, while other State and all federally aided highway mileage is recorded on the basis of distance only, with no increments for additional width. Differences also exist in the definition of "new construction"; all federally aided work is classified as "new construction" since Federal law specifically prohibits the use of Federal funds for maintenance or repair work, but similar work which is not federally aided may be classified as "maintenance" and excluded from the new construction figures reported by the State highway department. The construction of publicly owned or managed

toll road authorities also is excluded. The annual construction cost data are a fairly accurate measure of State-administered capital investment in highways during the past 20 years but do not include any of the investment of local governments in most States. Exceptions include all counties in Delaware, North Carolina, and West Virginia, and eight counties in Alabama where road construction is under State control.

#### PUBLIC UTILITY WEALTH DATA

An inventory of water and sewage facilities in incorporated communities with 100 or more population and in unincorporated communities with 500 or more population was made by the Public Health Service in 1945. Subsequent inventories in 1948, 1955, and 1960-61 were restricted to communities of 25,000 or more population. These inventories contain information by State on the type of ownership, plant capacity, population served, and the dates the system was installed and put into operation but do not include any cost or value data for these facilities.

The book value of private and public water supply and treatment facilities was estimated by the American Water Works Association in 1950, 1955, and 1960 on the basis of information collected from a sample group of companies comprising 2.5 percent of all such companies. Data collected included original cost, year completed, and amounts and rates of depreciation.

Some idea of the cost of water and sewage facilities constructed under contract can be obtained from the construction expenditure figures published annually in the Engineering News Record. The usefulness of these figures for a State and local government wealth inventory is limited, however, by the fact that much of the construction work on publicly owned facilities is not done under contract.

Data on the tangible and intangible assets of public electric companies is compiled annually by the Federal Power Commission. These surveys encompass all companies with a capital investment of \$100,000 or more and give information on total financial reserves, reserves for depreciation, and the value of plant, equipment, and other tangible assets.

#### HOSPITAL INVENTORY

The American Hospital Association annually compiles and publishes an inventory of all licensed hospitals with information on the value of tangible assets, such as land, buildings, equipment, the value of intangible assets less liabilities, the year operations began, and the number of beds. These data are available by State and locality and are classified by type of ownership, private or public, and by the level of government in the case of publicly owned hospitals.

#### RECREATION SPACE SURVEY

An inventory of the net acreage of public nonurban outdoor recreation space was made by the U.S. Outdoor Recreation Resources Review Commission. The Federal- and State-managed recreation area acreage figures were verified directly by the administering agencies but nonurban local government recreation area acreage figures were compiled from published sources and State agency information without

verification by the local governments involved. This survey covered only a portion of public recreation landholdings of State and local governments since it excluded all such space within the boundaries of cities and towns. Acreage totals were tabulated by State and classified by level of government.

#### IV. SUMMARY OF RECOMMENDATIONS

##### A. DATA OBJECTIVES

The working group recommends that a wealth inventory of State and local governments include all types of tangible and intangible assets in terms of their current market value, classified insofar as possible by function, by type of asset, by level of government, and by State and standard metropolitan statistical area. However, decisions regarding the feasibility of this amount of detail have to be postponed until more information is obtained from pilot studies regarding the types of records and wealth data available in this sector.<sup>1</sup>

##### 1. Detail by function

The classification of State and local government assets according to the broad functional use categories currently used by the Bureau of the Budget to classify Federal expenditures and realty and personalty was recommended in order to maintain comparability between the two public sectors of the wealth inventory. Allocation of assets used in more than one functional use category should be made on the basis of predominant use.

The working group recognized that these functional categories differ from those currently employed by the Bureau of the Census in reporting State and local government finances but feels that reconciliation of these two schemes of classification should present no special difficulties. Categories which are common to both include education, public welfare, highways, aviation, water transportation, parks and recreational resources, courts, fiscal operations, and interest on debts. Some of the Bureau of the Census functional categories such as police protection, fire protection, sewage, sanitation, and utility expenditures do not appear as separate headings in the Bureau of the Budget classification but assets in these categories can be included in the general government category.

Assets of public agencies engaged in selling goods or services to the public included in the State and local government sector would not conform to the above-functional classification. The working group recommends that these be treated like the assets in the private sector

<sup>1</sup> The following qualifying statement was submitted by Dick Netzer: "In view of State and local government practices with regard to property accounting, it is highly likely that even a relatively lavish commitment of resources to the development of wealth data for the State-local sector will produce results which are incomplete and of doubtful reliability as benchmark estimates. I suspect that the principal usable result for tangible assets would be a set of physical volume data which, however, would have some major holes in it. Since even this would be a costly undertaking, it may be considered questionable, although I think it justifiable to pursue it on a pilot and preliminary basis as one step in a long-range program of fostering improvements in wealth data for this sector. A far more favorable benefit-cost ratio, in my opinion, would attach to efforts to improve the quality of *indirect* estimates of State-local wealth, by intensive exploitation of detailed expenditure data for earlier years and improvements in expenditure data in connection with current Federal statistical programs involving State-local governments (Census, Public Roads, Office of Education, etc.) especially the 1967 Census of Governments.

and classified according to standard industrial classifications to facilitate cross-classification between these portions of the wealth inventory.

## *2. Detail by type of asset*

The working group recommends use of the following major categories:

- Land.
- Buildings.
- Facilities and other structures.
- Machinery and equipment.
- Inventories.
- Mineral resources.
- Financial assets.

The classification of tangible assets should correspond insofar as possible to that used by the General Services Administration in reporting the assets of the Federal Government.

## *3. Detail by level of government*

The working group recommends that national aggregates be classified by level of government and by type of local government, i.e., counties, municipalities, townships, school districts, and special districts, and that totals for individual States be broken down by level of government. Additional detail by type of local government for individual States, although desirable, would not be feasible if local government data are based on estimates derived from a survey of a stratified sample of such units. If, as indicated in a later section of this report dealing with collection techniques, the costs of canvassing each and every local government do prove to be prohibitively high, local governments not included in the sample should be encouraged to compile their own wealth inventories.

## *4. Regional detail*

Assets should be reported for States and for standard metropolitan statistical areas, if possible. Detail for counties in certain functional categories such as education probably would prove useful, but the advisability of collecting this additional detail for each of the States is doubtful in view of the substantially larger cost this would entail.

## *5. Physical volume data*

A general belief that many users of State and local government wealth data would be interested in the physical volume as well as the value of major types of assets in this sector led the working group to recommend that land be reported in terms of acres, and buildings and other structures in terms of square feet of floor space. A pilot study would be needed to determine the feasibility of developing physical volume data on machinery and equipment used in connection with the various broad functional use categories at least on a sample basis. Standard definitions regarding the classification of physical volume data would have to be applied in the collection stage in order to maintain comparability in the reporting of machinery and equipment. The small amounts of diverse assets included in the inventories category makes the collection of physical volume data in this category inadvisable.

### *6. Leased assets*

The working group recommends that the inventory of State and local government wealth include assets leased by State and local governments from owners outside the sector as well as assets owned by State-local governments and leased to parties outside the sector in order that the amount of assets used in the sector as well as that owned by it is shown. However, assets owned by individuals and business enterprises outside the State-local sector should be reported separately so that these can be deducted from the totals of this sector when overall national aggregates are compiled. In the absence of value data for assets leased from outside the State and local government sector, current market values of these assets might be estimated on the basis of standard ratios which exist between gross rentals and market value for a number of types of rental property. However, caution should be exercised to avoid the use of subsidy rentals or the application of "standard" ratios to nonstandard properties.

It was recommended that leased assets be classified by function, if possible.

### **B. COLLECTION PROCEDURES**

The number of reporting units included in a wealth inventory of the State and local government sector depends in part on the amount of resources which can be devoted to data collection and in part on the amount of fieldwork needed to verify the raw data received from the respondents. A pilot study of the types of property records which exist in this sector is needed to clarify the latter requirement.

In the absence of sufficient information regarding the availability of wealth data in the State and local government sector, detailed recommendations regarding collection procedures were not possible. The working group tentatively suggests that all State governments and a sample of local governments, including at the minimum the 100 largest counties, the largest local government in each State, and a representative group of all other local governments be included in a survey of wealth data. The sampling procedures currently used by the Bureau of the Census in its census of governments were endorsed as a generally sound approach to this problem.

### **C. COLLECTION AGENCY**

The working group recommends the use of a single collection agency on the Federal level which can establish standard reporting definitions and procedures, such as the Bureau of the Census, as the best means of maintaining consistency in the collection and reporting stages of a national wealth inventory. However, consultation with Federal agencies with previous experience in data collection in this sector, such as the Office of Education and the Bureau of Public Roads, during the planning stage was considered advisable.

### **D. PILOT STUDIES**

#### *1. Pilot study of property records*

There was a general consensus in the working group that more information on the quality and types of property records in the State and local government sector as well as a better knowledge of the rela-

tive magnitude of the various assets in this sector was needed in order to evaluate the collection and reporting problems that a wealth inventory in this sector would entail. Without such information only tentative suggestions regarding the feasibility of a wealth inventory are possible.

The working group therefore recommends that a pilot study of the property records and assets of a sample group of State and local governments be made. Some governments with relatively poor property records as well as some of those with better ones should be included in such a pilot study since it is quite likely that these differ significantly.

A field study was considered the best method of obtaining the necessary information because of the great diversity in accounting procedures and organizational structures among local governments. It was felt that a mail questionnaire would produce very little in the way of useful information regarding the property records of local governments without a field evaluation of the results because of the lack of standardized terminology and reporting procedures. However, a mail survey conducted by the State Budget Officers Association was suggested as a possible source of information on property records and assets of State governments. The president of this organization, who was a member of the working group, indicated his willingness to cooperate with such a venture.

### *2. Pretests of inventory questionnaires*

In view of the relative lack of prior experience in the collection of wealth data in the State and local government sector, the working group recommends that some pretests of the proposed inventory questionnaires for this sector be made. This would facilitate the planning of the actual inventory and point out some of the trouble spots ahead of time.

### *3. Planning studies*

In addition to pilot studies of property records in a sample group of State and local governments, the working group suggests that additional information useful in the planning of a wealth inventory in this sector may be obtained from management consulting firms, who have conducted surveys of financial and other records for State and local governments, and from public officials responsible for keeping these records.

## V. VALUATION PROBLEMS AND RECOMMENDATIONS

The working group agrees that ideally the value of assets included in the wealth inventory of this sector should represent current market value. However, the fact that most State and local government property records are kept in terms of original cost and the lack of an active market for most tangible assets in this sector makes it necessary for these values to be estimated on the basis of available data. In general, the working group doubted the feasibility of asking respondents in this sector to make such estimates in view of the limitations of time and resources of most respondents and the lack of comparability of the raw data in this sector. The one exception to this generalization is the category of inventories and supplies for which most respondents would have fairly current market value data.

The working group therefore considered a number of alternative methods to estimate the current market value of tangible assets from the data believed to be available in this sector.

#### A. REPRODUCIBLE ASSETS

Replacement cost less depreciation was recommended as the basis for estimating the current market value of most reproducible assets such as buildings, facilities, and other structures, and equipment. This method would require as a minimum, the collection of data from a subsample of governmental units on the book value or original cost of depreciable assets, by types, and by year or period of acquisition. Then the estimating agency in the Federal Government could apply appropriate price indexes for each type of asset in order to revalue to current gross reproduction cost. To obtain estimates net of depreciation as an approximation to market price, the initial outlays at reproduction cost would have to be depreciated by the estimator using the best available information on average lengths of life of the durables. These problems are discussed in some detail in the report of the Working Group on Federal Government Wealth and need not be repeated here. It is obvious that additional information should be sought on the prices paid by governments for construction equipment and on the useful lengths of life of these durables.

An alternative source of market value data for buildings and other structures in this sector is insurance figures. Most local governments insure such assets although most State governments do not. The value placed on these assets for insurance purposes is a fairly reliable estimate of their current value and might constitute a valid check on estimates obtained by other means.

#### B. LAND AND OTHER NONREPRODUCIBLE ASSETS

The estimation of the current value of land owned by State and local governments presents a major problem. Most State and local governments do not maintain value records for land owned by them and those which do exist bear no consistent relationship to current market value. When property tax assessors are required to value tax-exempt property, as they are in a number of States, their assessments have a very low overall reliability. Since the property is exempt from the tax, the owner has no reason to challenge the validity of the assessment, nor has the governing body any incentive to see that reasonable accuracy is maintained. Therefore, the figures tend to be rather arbitrary and hastily considered, and constitute a poor source of information on current market value.

In order to maintain comparability with similar holdings of the Federal Government, the method recommended by the Public Lands Subgroup of the Working Group on Natural Resources for valuing Federal lands should be used to value extensive park and recreation land owned by State and local governments. A fuller explanation of the recommended approach is given in the report of the Working Group on Natural Resources but in brief this method involves the establishment of pricing boards in the various regions who would set "shadow prices" for Federal land exclusive of mineral resources. These

same estimates of market value could be applied to State and local land of a similar nature in these areas.

Some techniques of valuing other types of land owned by State and local governments are described in a separate memorandum found in annex B at the end of this report. Briefly, this memo suggests that land under public improvements can be evaluated in terms of alternative use. However, this approach involves complex calculations which entail a number of uncertainties. The memo suggests that the value of land under streets, which is a special valuation problem of significant proportions in the State-local sector, can be imputed on the basis of the average square foot value of the property facing the streets on both sides. Since the value of the land on two sides of a street may vary, an average value which ignores depth calculations would have to be used. This method assumes that the streets will remain in their present use since the presence of the streets directly influences the value of the land facing them.

From a practical standpoint, calculations of private land values to apply to public holdings in the State and local government sector probably would have to begin from local property tax assessment data, but, in view of the unreliability of such data in many areas, special devices for correcting this raw data would have to be used. Special expert panels made up of competent private appraisers could establish the average value of private land in a stratified sample of State and local government areas and use these figures to carefully check the assessment data obtained from other State-local jurisdictions. The resultant estimate of average square foot value for privately owned land in a local jurisdiction could then be imputed to the total area of publicly owned land. Any such method entails crudities which more refined valuation methods might mitigate but, for wealth inventory purposes, a relatively simple method, even if crude, has advantages.

## VI. FINANCIAL ASSETS AND LIABILITIES

The working group recommends that the wealth inventory of the State and local government sector include balance sheet information on financial holdings. If possible, data on types of financial assets of State and local governments currently collected by the Bureau of the Census for the census of governments reports should be expanded to provide the amount of detail on types of assets recommended by the Working Group on Financial Claims for the inventory of financial claims in the nonfarm business sector. Census data also needs to be supplemented with data on corresponding liabilities.

The exact magnitude of the financial assets and liabilities collection problem in the State-local sector cannot be ascertained without additional information on the type of information available in this sector, but on the basis of existing knowledge it would appear that a number of smaller local governments do not keep estimates of the potential claims against assets in funds such as fire and police pension funds. In general, the collection of inventory data for pension funds in the State and local government sector should correspond with the treatment of these assets in the business sector of the wealth inventory recommended by the Working Group on Financial Claims. This



group recommended that the Labor Department expand the information it now receives annually from private pension funds and that this be used as the basis of wealth inventory data.

## VII. INVENTORIES

The working group agreed in principle that data on inventories should be included in a wealth inventory of the State and local government sector, but there was some disagreement regarding the practicality of collecting such data in this sector. Some members of the working group felt that the poor quality of inventory records in the State and local government sector and the need to make seasonal adjustments in the values reported would make the collection task more difficult than the relative size of these assets in the sector warranted. A final decision would have to be made on the basis of the results of the recommended pilot study of property records in the State and local government sector.

### ANNEX A. CATEGORIES OF WEALTH IN PUBLIC SCHOOL SYSTEMS

A. Reproducible assets and land (see Manual—U.S. Office of Education. "Property Accounting for Local and State School Systems," Bulletin 1959, No. 22).

1. School plant including sites, buildings, and equipment.
2. School system supporting facilities, i.e., garages, parking lots, administration buildings, etc.
3. Equipment unassigned to particular schools.
4. Inventories.

NOTE.—Records are kept primarily in terms of original costs, costs of additions, and a quantitative measurement.

B. Intangible assets—Reference is U.S. Office of Education. "Financial Accounting for Local and State School Systems," Bulletin 1957, No. 4; and "Common Core of State Educational Information," Bulletin 1953, No. 8.

1. Fund balances:
    - (a) Reserves for current operation.
    - (b) Reserves for capital outlay.
    - (c) Reserves for bond interest and redemption.
    - (d) Reserves in clearing accounts.
  2. Employees' retirement systems—portion to which beneficiaries do not have vested rights.
  3. Permanent school funds (State):
    - (a) Land—acreage and value.
    - (b) Principal and accrued interest.
    - (c) State indebtedness for assumption of land or funds from permanent school funds (a few have recognized a perpetual debt).
  4. Permanent school funds (local).
- C. Liabilities:
1. Indebtedness—bonded, short term, tax or State aid anticipation notes, warrants outstanding.
  2. Amounts due under lease contracts with school authorities.
  3. Judgments.
  4. Contracts for construction not yet complete or accepted.

### ANNEX B. MEMORANDUM ON LAND VALUATION TECHNIQUES

A number of States require that local assessors place a value on tax-exempt property and these figures are published from time to time. They have, however, a very low overall reliability. Since the property is tax exempt, the owner does not have reason to challenge any figures placed on it by the assessment authorities, nor has the governing body reason to see that the figures are main-

tained at a respectably high level. Therefore, the figures tend to be arbitrary and hastily considered.

The usual tests of a willing buyer, willing seller rule are especially difficult to apply to property held by tax-exempt institutions. During the past 10 years a surprising number of churches have been sold from one congregation to another, but schools and most other types of public property almost never sell.

The land under public improvements or open-space land owned by the public can be evaluated in terms of alternative use. The technical appraisal processes are complex and subject to error but in the hands of competent experts are reliable enough to establish guidelines.

The imputation of a land value to public land, which is used for street purposes, involves a series of assumptions. The value of the property facing the street is dependent upon the existence of the street. The influence of the street may be negative; i.e., in the older sections of some cities the meanderings of ancient streets cut up tracts of land which would be of greater value if assembled. In most cases, however, the street is a positive factor and the land would be worth far less without it.

Land is worth more toward the front of any lot than it is at the rear of the same lot. Appraisers in general follow some variant or other of the "4-3-2-1 rule." This rule holds that 40 percent of the value of any piece of land, 100 feet deep, attaches to the 25 feet closest to the street, 30 percent attaches to the next 25 feet, 20 percent to the third 25 feet and 10 percent to the rear 25 feet. If the land has a depth greater than 100 feet, additional increments of 25-foot depth are worth progressively less as the distance from the street increases. Hence, an immediate question arises whether the land under the street is worth as much as the immediate street frontage or whether it should be valued on the basis of the average of the total depth of the property facing it.

One possible method would rest on an hypothesis that streets could be evaluated on the basis of the average value of private property facing the street on both sides. In many instances the land on one side will have a greater value than that facing the other side. The hypothesis would suggest averaging the value of the two sides as well as a decision to ignore the depth rule.

An alternative approach, which is simpler, would apply an average value for land throughout the city. Assuming for arithmetical convenience that this calculation indicated a value of \$1 per square foot, all streets in the city regardless of location would be valued at \$1 a square foot.

From a practical standpoint, such widespread calculations of land value would start from local assessment data. These could be checked with such sales figures as are available from State tax equalization boards and private sources and a corrected estimate made of total land value in the corporate limits of the municipality. While this latter method entails theoretical crudities which would be absent from some of the more refined methods, the convenience of its use suggests that it receive some consideration.

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APPENDIX II: PART C  
REPORT OF THE WORKING GROUP ON HOUSEHOLD  
WEALTH  
Prepared by F. THOMAS JUSTER

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MEMBERSHIP OF THE WORKING GROUP ON HOUSEHOLD WEALTH

- James C. Byrnes, Population Division, Bureau of the Census.  
Charles S. Friedman, Office of Business Economics, Department of Commerce.  
F. Thomas Juster (secretary), National Bureau of Economic Research.  
Helen H. Lamale, Division of Living Condition Studies, Bureau of Labor Statistics.  
Robert J. Lampman, Council of Economic Advisers and University of Wisconsin.  
Charles A. Lininger, Survey Research Center, University of Michigan.  
E. Scott Maynes, Department of Economics, University of Minnesota.  
Milton Moss, Office of Statistical Standards, Budget Bureau.  
Jean L. Pennock, Agricultural Research Service, Department of Agriculture.  
Dorothy Projector, Consumer Credit and Finance Section, Federal Reserve.  
Gertrude Weiss, economic consultant, Somerset, Md.  
Arthur F. Young, Housing Division, Bureau of the Census.

## PREFACE

The Working Group on Household Wealth met on three occasions: August 2, September 26, and December 6, 1963. The first meeting was given to discussion of existing data and general examination of the problem, the second to detailed discussion of procedures for obtaining data, and the third to discussion of a tentative and incomplete draft, examination of priorities, and detailed discussion of specific survey procedures. Several members of the group, at the request of the chairman, submitted proposals for dealing with certain areas of household wealth; in addition, many of the recommendations in the final report originated with members of the working group.

The report is, of course, the responsibility of the secretary. I have attempted to reflect the consensus of the group, although no member should be held responsible for all of the views and recommendations contained in the report. Individual members of the working group have been free to write supplementary statements, clarifying their individual views or dissenting from recommendations, if they so desire.

F. THOMAS JUSTER.

## HOUSEHOLDS

### I. USES OF WEALTH ESTIMATES

Analysis of expenditure data strongly suggests that an increasing share of tangible wealth in the United States consists of assets that yield consumption services directly rather than indirectly. Such assets (houses, automobiles, household appliances, etc.), are typically owned by households rather than by business firms. Partly for this reason, household tangible assets, except for housing and land, have been largely ignored as a source of national wealth and of real income. Yet the evidence suggests that by the 1950's expenditures by consumers on housing and durable goods exceeded expenditures by business firms on capital goods, continuing a trend that has been observable since the early 1900's.

Further, the variability of household expenditures on tangible assets is now larger, in absolute terms, than the variability in business expenditures on such assets. The evidence thus suggests that not only do we need to know a good deal more about tangible asset formation in the household sector, but we need to know a good deal more than we do about the way in which household behavior is related to the stock of household tangible assets.

A comprehensive census of household tangible wealth would serve a number of analytical and public policy purposes.

1. An accurate estimate of household wealth in the form of tangible assets is of interest per se, since it provides the benchmark against which future trends can be measured.

2. A household wealth inventory would facilitate our measurement of output itself, since a proper measure of output in a country like the United States surely involves the use value of the stock of household assets rather than gross outlays on newly produced assets.

3. Estimates of the distribution of national wealth, now based almost entirely on financial (intangible) wealth would be greatly improved; the distribution of tangible wealth among households is probably quite different from the distribution of financial wealth.

4. By providing accurate data on stocks of goods in the hands of consumers, a wealth inventory would permit economists concerned with the analysis of consumer saving and spending behavior to incorporate the influence of stocks. Much recent work in the field of consumption theory consists precisely in the attempt to integrate stocks into a behavior model that focuses on the explanation of expenditures.

5. A wealth inventory could be used as a vehicle to improve our information about depreciation rates on household tangible assets; hence, it could facilitate better estimates of household wealth for past periods from the combination of known expenditure data and more adequate depreciation estimates.

6. By permitting a more accurate estimate of total tangible wealth, a household wealth inventory would contribute to a better understanding of long-term movements in the capital-output ratio.

## II. REVIEW OF EXISTING DATA

### TANGIBLE WEALTH

A comprehensive survey of household tangible wealth has never been taken in the United States. There have been several attempts to reconstruct wealth estimates on the basis of deflating, depreciating, and then cumulating data on expenditures.<sup>1</sup> The most comprehensive of these studies are those reported by Goldsmith, which provide estimates for the most important categories of household tangible wealth for each year over the period 1897 to 1958. The Goldsmith figures are based on application of the perpetual inventory method to the durable goods expenditure categories in the national income accounts. Hence, they are not estimates of total household wealth as we would define it, although by far the most important components are included. For example, the Goldsmith figures do not include wealth in the form of personal clothing, nor do they include do-it-yourself home improvements, semidurable home furnishings, or inventories of perishables.

More important, the Goldsmith estimates are necessarily aggregates for the entire household sector, since they have been derived from aggregate expenditure data. No information is available about the distribution of tangible wealth among households. Further, the household sector itself is a fairly crude residual; for example, the amount of furniture owned by households as opposed to business firms or other sectors is based on an arbitrary and quite dated breakdown.

Finally, wealth estimates computed in this fashion can only be as good as the depreciation data on which they are based. The procedure is to apply an estimated depreciation rate to relatively broad categories of durables—furniture, household appliances, etc. The depreciation rates are presumably the best and most reasonable ones that could have been used, but they contain an unknown margin of error. In our view, household wealth estimates based on a combination of expenditure and depreciation data should be regarded as a spur for the improvement of our information about household tangible wealth rather than as a source of reliable information that needs only a bit of refinement. In sum, the Goldsmith estimates clearly indicate that household tangible wealth is a large and growing component of total tangible wealth. We need to know much more about it than we do now.

Aside from the perpetual inventory estimates, there exist fairly reliable survey-based estimates for two of the major components of household wealth, and a few scattered survey-based estimates for other commodities. Census data on the housing stock appear to be quite reliable in most respects except that they do not distinguish clearly between the household (direct consumption) and business use of residential structures. Estimates of the stock of passenger cars have been prepared by the Office of Business Economics based on the following: (a) Sales of domestic cars and registrations of imported cars; (b) sur-

<sup>1</sup> Reavis Cox and more recently, R. W. Goldsmith.

vival rates derived from R. L. Polk data, with adjustments; (c) new-car prices, adjusted for equipment, transportation costs, and discounts; and (d) used-car prices based on market and alternatively on assumed straight-line and various declining balance depreciation rates. New tabulations of 1960 census data provided the basis for a distribution of the passenger car stock among households by various demographic and socioeconomic characteristics. In addition to these Federal Government statistics on owner-occupied housing and automobiles, the survey of consumer finances (conducted by the Survey Research Center at the University of Michigan) has obtained survey data on the value of housing and automobiles; the most recent such data were obtained in 1962.

A limited amount of wealth information has been obtained for household durable goods and appliances. For example, both the Survey Research Center (University of Michigan) and the Census Bureau have obtained ownership data for washing machines, refrigerators, ranges, dishwashers, clothes dryers, television sets, hi-fidelity equipment, and room air conditioners. The consumer expenditure surveys conducted by the Bureau of Labor Statistics have also obtained some ownership data on house furnishings and equipment. In general, however, these data do not constitute adequate wealth estimates because systematic information is not available on prices paid or age on a few household durables. Plans are currently underway at the OBE to obtain information similar to that already obtained for automobiles.

For other categories of household tangible wealth, some scattered survey data have been obtained. For example, the Department of Agriculture has taken surveys of clothing stocks and furniture stocks in local areas, obtaining detailed data on ownership but limited information on prices paid and age of item.

Finally, a national but nonrandom sample of 20,000 member subscribers to Consumers Union of the United States was surveyed in 1958-60 with respect to ownership of a long list of household appliances, automobiles, housing, and furniture. Prices paid, age, and condition of stock were requested on this survey, which was conducted entirely by mail. The Consumers Union data have not yet been fully processed. Because of the nonrandom nature of the sample the main use of these data would presumably be in testing behavior relationships rather than in estimating either aggregates or distributions.

The available survey data on household tangible wealth can only be described as seriously inadequate except for houses and automobiles. While it is true that these are the two most important single components of household wealth, other household tangible assets are a large part of the total.

In 1958, for example, the Goldsmith estimates indicated that the stock of household durables was larger than the stock of automobiles, and the figures for household durables exclude at least clothing and semidurable home furnishings.

#### DEFICIENCIES OF EXISTING SURVEY DATA ON TANGIBLES

Available survey information on household tangible wealth has a number of shortcomings that can be remedied if sufficient resources are available.



(1) None of the available survey data cover more than a small number of major items of household tangible wealth; most surveys are limited to automobiles, major appliances, and TV's.

(2) Available data generally do not cover ownership of multiple items, except for automobiles and housing. The importance of multiple item ownership in the United States is growing rapidly.

(3) Available data do not usually distinguish between the existence of an item of tangible wealth and the question of whether it retains any functional utility. This problem is not serious for the items now covered by surveys, but would be important for any comprehensive survey of tangible wealth. For example, a second refrigerator used to store overflow is an item of wealth with positive value; but one kept in the basement because it had not yet been discarded is not. Similarly, clothing still in existence but not worn because of age or state of repair should not be counted as tangible wealth.

#### INTANGIBLE WEALTH

Household financial assets and liabilities have been studied nationally in two specially designed survey projects: the FRB-Census high-income project and the Survey Research Center annual consumer finances project. These two projects differ greatly in the amount of detailed questioning for assets and liabilities. The 1963 FRB-Census study investigated a detailed array of items with a sample heavily loaded at high-income levels; much of the detail requested has relevance only to such a sample. Although the samples used for the Survey Research Center studies were not equal probability samples, the high-income loadings were not as heavy as in the FRB-Census project. The Survey Research Center studies of 1953 and 1962 covered much the same asset and debt concepts as the FRB-Census study, but respondents were approached with much less detailed questioning.

The FRB-Census data are not yet available<sup>2</sup> for comparison with data from the Survey Research Center, but the latter have yielded underestimates of aggregate private holdings of assets and debt.

Methodological studies have indicated that problems of gathering these data are substantial. On an individual family basis, both over-reporting and underreporting are frequent, although the net result appears to be underreporting of financial assets and debt.<sup>3</sup> The data from financial institutions used to evaluate the aggregate estimates from surveys have never been systematically studied for comparability with the data reported in surveys. For example, it is not known how much of the discrepancy between survey based and institutionally based financial institutions is due to differences in the concepts used by institutions and reporting households.

Considering the apparent reporting errors in the survey data, it will be asked whether it is desirable to collect financial asset and debt information on a wealth inventory mainly concerned with tangible wealth. We think some data on intangibles should be collected. First, collection of intangibles from the same sample for which tangible assets are collected will provide more complete net and gross worth

<sup>2</sup> Preliminary results from the FRB-Census survey were published in the March 1964 Federal Reserve Bulletin.

<sup>3</sup> Lansing, Ferber, and Maynes have done most of the methodological work in this area.

data for consumers than has previously been available. Two, survey methods, though perhaps biased and unsuited for the construction of aggregate intangibles, are believed to indicate relationships with reasonable accuracy. That is, relevant comparisons can be made between subgroups, just as comparisons over time are relevant if based on surveys employing similar methods.

In addition to the survey estimates, Goldsmith, Lipsey, and Mendelson have published sector balance sheets for the Nation for 1945-58, and for selected years from 1900 to 1945. Seven sectors—nonfarm households, nonfarm unincorporated business, agriculture, nonfinancial corporations, finance, State and local governments, and the Federal Government—have been defined. All nonprofit institutions are included in the nonfarm household sector, largely for lack of information on how to do it otherwise. The “nonfarm household estimates are derived almost entirely as residuals \* \* \* the balance sheet of this sector, therefore, includes all items mistakenly omitted from other sectors and the consequences of all errors made in estimating total outstanding for any instrument.”<sup>4</sup> No doubt these balance sheets will be prepared for later years. It would be an important contribution of any new program of data collection to make independent estimates for the items estimated by the methods of residuals.

In conclusion, it is apparent that much constructive work has been done in the collection of basic data and preparation of estimates relating to household wealth. The chief problem is that the data and estimates are not comprehensive, nor necessarily consistent. In the subsequent discussion, since we are concerned with developing comprehensive data on a consistent basis, it may appear that we are approaching the whole field de nouveau. To the contrary, much has been learned from the experience to date.

### III. COVERAGE OF THE HOUSEHOLD SECTOR

How is the household sector to be defined? What are the distinguishing features of household tangible wealth, as compared to wealth allocated to other sectors of the economy? The simplest criterion to use appears to be that of legal ownership. By definition, household tangible assets must yield consumption services directly to their owner, not indirectly via explicit or implicit resale to a user. Thus, a house being lived in by its owner is an asset falling into the household sector, while a rented house is an asset of the real estate industry. The legal ownership distinction, however, will not always constitute a satisfactory basis for a meaningful classification. For example, many individuals use part of their house for what is essentially a business purpose; doctors and lawyers are the most obvious cases in point, but the practice is more widespread than that. We would suppose that a house being used in part for the purpose of keeping an investor's financial records should be considered as partly a business asset in the

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<sup>4</sup> Goldsmith, Lipsey, Mendelson, “Studies in the National Balance Sheet of the United States,” vol. II, Princeton University Press, 1963, p. 17.

Goldsmith employs 20 intangible assets categories and 13 categories of liabilities. Two of the asset categories (loans on securities and bank loans, not elsewhere classified) and seven of the liability categories are not relevant for nonfarm households, agriculture, or unincorporated business. Goldsmith uses, therefore, 18 asset categories and 6 liability categories for the sectors we are concerned with.

financial sector, partly a household asset. The part of the house serving a business purpose is clearly an asset used to produce money income rather than an asset yielding a direct flow of consumption services to the owner.

On the other side, there are large numbers of tangible assets owned by business firms and used directly by households. For example, a taxi driver who owns his own cab typically obtains some personal consumption services from the automobile. Many individuals are provided with or have access to company cars as part of their conditions of employment. There is little substantive difference between a company car used partly for personal consumption and enjoyment, and a privately owned car used partly for business purposes. In addition, there are respects in which the household sector shades off into the public sector. For example, every family in a community has access to a community swimming pool, while some families own their own pools.

There is no single solution to the problem that would satisfy all users. It seems to us, therefore, that data should be obtained on both a legal ownership and on a use or availability basis. For estimating the flow of consumption services produced by the stock of tangible assets, use or availability is presumably the appropriate criterion. But for analyzing expenditure decisions, legal ownership may be more satisfactory.

We have much more experience with the sectoring problem for intangible than for tangible wealth. We see no concrete reason why satisfactory estimates of tangible wealth, both owned and/or used in the household sector, could not be obtained from a survey-type inventory. However, some of the problems in reconciling financial estimates derived from surveys with those derived independently from other sources may also arise for tangible wealth. These problems, and some proposed solutions for intangible wealth, are discussed in annex A to this report.

#### IV. CONCEPTUAL PROBLEMS IN THE MEASUREMENT OF HOUSEHOLD WEALTH

##### VALUATION

How should household tangible wealth be valued, in principle? For measuring the value of stock, the discounted flow of consumption services produced by the stock is presumably appropriate. In a perfectly functioning market, the current market price of the asset will appropriately reflect this value. In the household sector, however, markets are far from perfect, especially with respect to the used assets which comprise the bulk of the total. For the most part, therefore, we would presumably have to be content with measuring original cost, adjusting by an index of price change, and depreciating in accordance with estimated service life.

On the other hand, for measuring the current flow of services produced by the stock, it is not so clear that old assets are worth less than new ones; in some cases depreciation can be ignored provided the asset remains in use. Valuation in terms of the discounted flow of future services yields an estimate of the "net" stock of tangible assets,

while ignoring depreciation as long as the asset continues in service yields an estimate of the "gross" stock of durables. Again, it can be argued that both estimates should be obtained since both are useful. The flow of consumption services from many household tangible assets is completely independent of age provided that the asset is in good working order: for example, no one wants a washing machine per se; what is desired is a flow of clean clothes. Similarly, no one wants a vacuum cleaner in and of itself; what is desired is a clean house. For these types of assets, gross stocks seems to provide the best measure of the current flow of consumption services produced. For other assets, like furniture and probably automobiles, the newness or style of the asset is an important part of the current flow of services. In this case, the asset does not provide as large a flow of services when it is old as when it is new.

In our view, an adequate solution to the valuation problem depends on the degree to which two related problems can be managed. First, are there available or can there be constructed good price indexes that make reasonably accurate allowances for quality change? This is an especially serious problem in the household sector; technological change has been exceedingly rapid and there is vigorous disagreement about the adequacy with which existing price indexes standardize for quality. Second, can we obtain reliable estimates of service life and the rate of depreciation? Both these problem areas deserve special attention and study prior to embarking on a full-scale household wealth inventory, since the adequacy of the estimates, even assuming away all the data collection problems, depends heavily on satisfactory price and depreciation estimates.

#### COVERAGE

Which household tangible assets should be included in a wealth inventory? By tangible wealth we presumably mean a stock of goods capable of yielding a flow of future money income or future services. Two questions need to be examined: (1) Conceptually, what should be counted as household tangible wealth?; (2) in practice, which items or groups of items do we want empirical estimates for, given that information has a cost?

Two kinds of cutoff criteria come to mind:

1. Durability or expected service life.
2. Unit cost.

The service life criteria is the conceptually relevant one, since tangible assets used up in less than some minimum time period are clearly best classified as current consumption rather than as part of the stock of assets. Further, it makes economic sense to treat even very inexpensive items of household wealth—cups and saucers for example—as capital assets yielding a flow of real income to the owner. There is after all, a restaurant industry. In purchasing the services of this industry—a meal—one is buying in part the services of cups, teaspoons, and dishes. If these constitute an asset to the restaurant industry, they surely must also constitute an asset to households who prefer to eat in rather than out. In fact, of course, we think it quite probable that cost considerations will dictate a cutoff below the level of "everything". Obtaining a comprehensive inventory of all household assets would be a very expensive and time consuming proposition, and the expense

of obtaining the last several hundred pieces of information may be quite large relative to the value of the information. A case in point is food and fuel inventories, especially the former. The cost of gathering accurate data is likely to be substantial, and it may be questioned if the information is worth the cost.

## V. PROBLEMS IN COLLECTING WEALTH DATA

### REPORTING DATA

Which vehicle should be used for a household wealth inventory? In general, two types of procedures are feasible. The first is the perpetual inventory method, the one used in the Goldsmith estimates, for which the necessary ingredients are data on expenditures, initial stocks, and depreciation. It seems to us that this method is better suited to updating the results of a comprehensive inventory than for producing the inventory from scratch. As we have noted before, both the comprehensiveness and the reliability of the available perpetual inventory estimates are very difficult to judge, and we think an alternative approach is necessary. The only other alternative consists of some kind of household survey.

For this purpose, it seems to us that the 1970 decennial census records could be used as a universe for the selection of household wealth inventory sample housing units. There may well be need to use more than one sample from the housing census frame, since there are several highly specialized types of assets where sampling errors will be minimized with unequal weights for the sample. Further, it seems to us quite probable that a good deal of experimentation will be essential in order to get the most from the resources available for the wealth inventory. Many of the problems involved have never been faced before. Judgments about what is feasible are based on intuition rather than experience, and many of the important questions do not presently have clean-cut answers.

The survey procedure has the additional advantage of providing a possible basis for improving our knowledge of depreciation rates, hence for reworking estimates of household wealth based on expenditure and depreciation data. From a wealth inventory, it is possible to construct good depreciation estimates for particular items provided that sales to households of the item are historically available in terms of numbers of units, and provided that the age of each item in the current inventory can be established. The number of units still in existence can be established from the survey. If the age of each item in the inventory is also known, the data show the number of units still in existence that were produced 1, 2, 3, 4, . . .  $n$  years ago; that is the data provide one point on a survival curve for each historical year. From future surveys, additional points on the survival curve can be located. Eventually the entire survival curve can be estimated, permitting an estimate of the depreciation rate, as well as changes in the rate, over time. The major difficulty with this approach is that respondents may be unable to estimate age, particularly if the item was acquired used rather than new. Further, the necessary estimates of sales to households can only be obtained by adjusting production estimates for sales to nonhousehold units, and experience with attempts to do this for other purposes has not been encouraging.

An alternative approach, which has been tried in the field for several household tangibles, is to estimate service life from survey data on date of acquisition and discard;<sup>5</sup> that is, respondents are asked when each item in their current inventory was acquired, and whether it was acquired new or used. If an item was acquired during the past year the respondent is then asked whether a similar item was removed from the inventory, and, if so, when the *removed* item had been acquired. From such data independent actuarial tables for new and used items can be constructed and average service life under one owner estimated.

#### TECHNICAL PROBLEMS

Given that a survey of tangible wealth is desirable, a number of problems need to be explored.

1. What are the limits on interview time? We think it likely that the optimum interview (least cost per unit of data) is likely to be fairly long and is likely to involve some investment in the conditioning of the respondent. Experimentation, review of experience on response rates, and validation studies are necessary to establish the optimum, and we do not think anyone really knows how far the limits can be stretched. For example, to pose an extreme question: Is it really the case that an interview lasting 30 hours, taken over the period of several days, is out of the question?

2. What kinds of wealth information can survey respondents be expected to know, and what is the best technique for obtaining the information?

3. To what extent can inventory information be obtained by leaving forms to be filled out at the respondent's convenience, using the interviewer only to explain the schedule and check the responses? Is it better to do this only for some categories of tangible wealth? If so, for which categories?

4. What criteria should be used to value household wealth that is physically attached to the house—carpeting, for example? Should the house be valued at its stripped cost, or with whatever furnishings were included in the purchase price, or at some specified combination of the two? The problem here is that consistency of treatment among households is essential if the results are to be meaningful, but the valuation problem is simplified if items purchased with the house are valued as part of it.

#### SURVEY DESIGN

The question of survey design cannot be disentangled from the question of use. As noted before, there are three general uses to which inventory data might be put. First, how large is the stock of household tangible wealth? Second, how is household tangible wealth distributed among the population, and how does its distribution differ from that of intangible household wealth? Third, how does the stock of tangible wealth relate to or influence expenditure behavior?

It seems clear that the most efficient survey design for the first two uses (aggregates and distributions) will be different from the most

<sup>5</sup> See Jean L. Pennock and Carol M. Jaeger, "Estimating the Service Life of Household Goods by Actuarial Methods," *Journal of the American Statistical Association*, June 1957; and, by the same authors, "Household Service Life of Durable Goods," *Journal of Home Economics*, January 1964.

efficient design for the third. The first two uses are indispensable for compiling an inventory of national wealth. The third use essentially constitutes a plus that would be nice to have.

These uses are in conflict because some analyses of behavior require that all the relevant pieces of information be obtained for every household: it is not sufficient to assign values to tangible stocks based on averages for categories or classes of households. But for estimates of either aggregates or distributions, it is immaterial whether data are obtained from a single sample of household or from a large number of samples, each of whom is asked about categories of household wealth in considerable detail. Since there are probably limits—albeit unknown ones—to the amount of data that can be extracted from a single household without sharply diminishing returns in accuracy and response rate, the optimal survey design for getting aggregates and distributions is almost bound to include use of a number of sub-samples specifically designed to obtain certain types of aggregates.

To get at this problem more precisely, let us spell out some general principles of data collecting, based on experience and theory.

1. It seems to be clearly established that the development of accurate information on intangible assets requires a sample that is heavily weighted with high-income households. Sample loading is required in order to minimize variance. The Federal Reserve Board-Census survey of financial characteristics, which has been completed but not fully processed, is surely the most comprehensive attempt ever made to obtain data on financial aggregates from households. Their experiences suggest, as a minimum, that a survey of tangible household assets simply cannot be added on to a survey that covers household intangible assets completely. The best that might be done is to obtain some highly aggregated information on intangibles from households asked to cooperate in a survey of tangible wealth.<sup>6</sup>

2. Experience indicates that the best way, perhaps the only way, to build up an accurate estimate of tangible wealth for any particular category of goods (furniture, major appliances, etc.) is to build up the aggregate from a detailed listing of the inventory. Expenditure surveys always indicate that the more detailed the listing of products, the larger the aggregate total of expenditures. Theory and casual observations support this empirical conclusion. No one can reasonably be expected to make a good top-of-the-head estimate of his aggregate holdings of any category, but he ought to be able to provide enough information on the details of each individual item so that an aggregate can be constructed.

3. The necessity for building up aggregates from details suggests that a household wealth inventory may be impractical to obtain from any one sample of households. The necessary detail would very probably exhaust the patience of any respondent, and might disastrously affect the accuracy of whatever responses are obtained. This is especially the case for any household whose stock of tangible assets is reasonably large.

4. A survey, or surveys, of the kind we contemplate is much more apt to be successful if respondents are carefully conditioned in ad-

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<sup>6</sup> The inclusion of values for houses and automobiles in the wealth estimates available from the Census-FRB survey of financial characteristics provides an additional means of bridging the gaps among various surveys.

vance. Experience suggests that the proper conditioning of respondents can stretch out the limits of interviewing time to a very considerable degree.<sup>7</sup>

5. It is probably not reasonable to expect respondents to provide market value, except for durables with active secondhand markets like housing and automobiles. It is reasonable to expect respondents to be able to approximate year of purchase and purchase price for major pieces of equipment, but it may not be reasonable to expect respondents to approximate age for items purchased secondhand to begin with.

#### WHAT ARE THE DESIRED OUTPUTS FROM A HOUSEHOLD WEALTH INVENTORY?

##### *Tangible assets*

The primary output from the wealth inventory should consist of estimates of the current value of the stock of tangible assets for each of a number of broad categories of goods. The categories should be easily translatable into those used in compiling expenditure data for the national income accounts, so that the inventory will yield the stock equivalents to the currently available expenditure data. As a start, we suggest the following classification:

1. Houses.
2. Automobiles.
3. Major household appliances.
4. Small household appliances.
5. Major recreation durables.
6. Furniture and floor covering not attached.
7. Other major durables, not elsewhere classified.
8. Small household durables.
9. Clothing and semidurable home furnishings.
10. All other, which would include toys and sporting equipment, hobbies, books, jewelry and watches, and ophthalmic products.

Detailed classifications covering some of these categories are included in annex B. Major household appliances are shown in section 1 of the annex; small household durables and appliances in section 2; major recreation durables as section 3; clothing as section 4; most of the product groups in "all other durables" as section 5.

In addition to estimates of the value of stock in broad categories, we feel that data on a limited number of specific major items of tangible household wealth should also constitute primary output. The items we have in mind constitute a major share of household tangible wealth. Most people expect to see such data in a tangible wealth inventory, and they are of special interest to numerous institutions and individuals. For these items, listed below, we need to know ownership, purchase price, age and general condition:

- |                               |                           |
|-------------------------------|---------------------------|
| 1. House (owned apartment)    | 8. Refrigerator           |
| 2. Vacation house (apartment) | 9. Clothes dryer          |
| 3. Automobiles                | 10. Dishwasher            |
| 4. Second automobile          | 11. Air conditioner       |
| 5. Other automobile           | 12. Television set        |
| 6. Washing machine            | 13. Hi-fidelity equipment |
| 7. Range or stove             | 14. Boat                  |

<sup>7</sup> It is probable that the real difficulty is not the time of the respondent but his involvement. One useful device is to promise the respondent some results of the survey—perhaps an estimate of the value of his own inventory of tangible wealth—in return for his cooperation.



*Intangible Assets*

In addition to the desired outputs of aggregate value of stock in broad categories and values for selected individual items of tangible wealth, some information on intangible assets and liabilities should be collected. A comprehensive listing of the desired output is shown in annex C. If resources will not permit this amount of detail, estimates of amounts in each of the major categories (liquid assets, debt instruments, common or preferred stock, other intangible assets, housing debt, and other consumer debt) should certainly be obtained. Even rough amounts picked from a flash card with broad brackets (none, under \$500, \$500 to \$999, \$1,000 to \$4,999, \$5,000 or more) would serve a useful purpose, although such estimates would be valuable mainly for analysis of distributions and subsequent behavior, not for construction of aggregates.

We also think it important (and inexpensive) to obtain some information on the stock of educational capital embodied in the household. This would require data on age distribution, number of years of formal schooling, degrees obtained, family income, and perhaps a few other things. This information is obviously not critical for estimating either the aggregate stock of tangible wealth or its distribution. However, it seems to us comparatively inexpensive to pick up on a wealth survey, and its analytical uses would be considerable. This seems to us one of the few areas in which the analytical needs do not seriously conflict with the objective of getting the best possible estimate of the stock of tangible wealth.

## PROCEDURES FOR OBTAINING DESIRED OUTPUTS

There seem to us two general approaches to this problem. The first approach would be use of split samples to build up estimates of aggregate household wealth and its distribution among households. Information on age, ownership, purchase price, and condition of stock would be obtained from a large national sample of households for each of the durable commodities listed below in table 1. The sample would be large enough to permit stratification by geographical area, and perhaps by State or standard metropolitan areas as well. The items included in the detailed listing would cover all of the major consumer durable goods (including housing) that comprise important elements in household wealth, and the list would be short enough so that the burden on the respondent would not be impossibly large.

TABLE 1.—Inventory information to be obtained from national sample of households

Product	Number owned	Age or model year <sup>1</sup>	Market value or purchase price <sup>2</sup>	Condition	Method of acquisition			
					Purchased from—		Received as gift	Buy with house
					Com-mercial dealer	Friend or rela-tive		
House <sup>3</sup> :								
Year-round resi-dence.....								
Summer resi-dence.....								
Automobiles:								
Family car.....								
2d car.....								
Other cars.....								
Appliances:								
Washing ma-chine.....								
Stove or oven.....								
Refrigerator.....								
Clothes dryer.....								
Dishwasher.....								
Air conditioner.....								
Vacuum cleaner.....								
Garbage dis-posal.....								
Recreation durables:								
Television set:								
1.....								
2.....								
Hi-fi equipment.....								
Piano.....								
Boat.....								
Swimming pool.....								
Furniture:								
Living room:								
Sofas.....								
Chairs.....								
Rugs.....								
Dining room:								
Table-chairs set.....								
Rugs.....								
Recreation room:								
Sofas.....								
Chairs.....								
Rugs.....								
Master bedroom:								
Beds.....								
Dressers.....								
Rugs.....								
Other bedrooms:								
Beds.....								
Dressers.....								
Rugs.....								

<sup>1</sup> A average age, for multiple items not listed separately in stub; i.e., rugs, sofas, etc.

<sup>2</sup> A average price, for multiple items not listed separately in stub; i.e., rugs, sofas, etc.

<sup>3</sup> Including owned apartment.

The information we think necessary to estimate the value of tangible wealth in the form of major durables (as shown in table 1) covers ownership, number owned, age, price, general condition, and method of acquisition. For the kinds of items listed (all involving large unit cost) we feel that most respondents would be able to provide the information with reasonable accuracy, although it might be difficult to obtain age for items originally bought secondhand. In most cases respondents would be asked for purchase price rather than market value; housing is the only clear-cut exception. In addition, we think it would be useful, for items acquired during the year preceding the survey, to find out whether a similar item had been removed from the inventory, and if so, either its age or the number of years that it had been owned and how it had been disposed of (sold, scrapped, given away, moved downstairs to the cellar, etc.). As noted earlier, from information of this sort service life estimates can be constructed.

The wealth estimates would be filled out by a number of special purpose surveys covering in detail such areas as:

1. Financial assets (as in annex C).
2. Furniture and major appliances (appliances as in annex B, sec. 1).
3. Small household durables (as in annex B, sec. 2, CES 3275 and 3276).
4. Miscellaneous small household durables (as in annex B, sec. 2, CES 3277).
5. Miscellaneous durables (as in annex B, sec. 5, CES 3716, 3713, 3715, 3722, 3732, 3735).
6. Books, records, and art objects.
7. Clothing and semidurable home furnishings (clothing as in annex B, sec. 4).
8. Jewelry and ophthalmic products.

For some of the special purpose surveys, less detailed information about individual assets would probably be satisfactory. For many of these items, it is likely that the only obtainable information consists of numbers of each type of item in the inventory (dishes, clothes, most semidurables). For these items, service life can be estimated by an inventory-acquisition ratio, providing that inventory can reasonably be assumed constant through time; if the price of acquisitions obtained during the preceding year is also obtained, value of stock can be estimated on the assumption that all items in the inventory should be assigned the price of new acquisitions. Estimates based on these assumptions should be adequate for the most part, and adjusted estimates can always be constructed by varying the assumptions.

Since the population distributions differ markedly for assets in the various categories covered by special purpose surveys, sampling errors would be minimized by selecting samples with differential "loading," e.g., the survey of financial assets and liabilities would be heavily weighted with high-income households, the survey of clothing weighted about like the population as a whole.

Because some inventory questions would be common to both the national sample and the special purpose samples, and because the most efficient "loading" would be different, separate samples would be drawn for each survey. A common set of classification variables—age, income, education, occupation, etc.—would be included in all samples.

Information would thus be available on major items of tangible wealth for each household in the national sample, and a comprehensive total built from considerable detail would be available for one category of tangible wealth for each household in the special purpose samples. Total wealth estimates could be obtained by a simple weighting and summing procedure applied to a few of the elements in the general purpose surveys (houses and automobiles) and to all the special purpose surveys, which should be designed so as to achieve complete coverage of household wealth. Alternatively, total wealth in the form of major pieces of household wealth would be available from the national sample; these figures could probably be extrapolated to approximate the total value of all tangible wealth. This procedure presents no difficulties for the construction of aggregates and distributions, but it makes it difficult to use the data for some kinds of behavior analysis. On the other hand, no one household would be faced with an impossible burden of reporting on all of its tangible asset holdings in great detail.

The second approach is somewhat more sophisticated than the first. It is not clear to us that it would be either cheaper or more accurate, although it may well be both. The general idea is to use statistical techniques to estimate the value of wealth for each household from key indicator items for that same household. First, we would start with a pilot sample—a relatively small sized one—from which an exhaustive picture of household wealth would be obtained, using whatever methods (payments, etc.) are necessary to persuade households to cooperate to the extent that would be required. Along with the exhaustive inventory of tangible wealth, we would obtain information on educational attainments, demographic status, income, and anything else which might reasonably be associated with the stock of tangible wealth. Having obtained the exhaustive inventory (literally running down to the tea cups) we would construct aggregates for each of these households in the kind of output classifications we thought desirable in principle. That is, we would construct an "ideal" set of estimates of household wealth for each of the households in our pilot sample, based on an expensive and painstaking construction of the aggregates from the details. Because the pilot sample would be small, the total expense might not be very great although the cost per completed interview might be high.

Having constructed the aggregates, we would then try to predict them. We could try to predict separately each of the desired output categories, or simply the total, or some of the categories in addition to the total, etc. The predictor variables would be those which seem sensible a priori and also give good results empirically. If it turns out that the variance of the known wealth values can be reduced very substantially by a fairly simple set of predictors obtained from the same household, we have a vehicle for predicting the total tangible wealth of any household for whom values of the predictor variables are known or can be obtained. In addition to the predictor variables, it might be useful to obtain estimates of particular items in the durables inventory for every household, as discussed earlier.

The regression procedure would obviate the necessity for obtaining detailed estimates of wealth holdings from every household in a large national sample, and would eliminate the necessity for any of the special purpose surveys. The only information required from the

entire sample would be the necessary indicator data—the predictors that emerge from the regression analysis—plus whatever information about tangible wealth is desired for its own sake as primary output.

There are, of course, some risks involved with this procedure. In any statistical analysis that relates the value of household wealth to, for example, value of house, income, age of head, value of dining room table, presence or absence of an air conditioner, etc. there are bound to be a large number of items that predict well in a pilot sample but which have no real relationship to the value of inventory. There must be a high degree of intercorrelation among the potential explanatory variables, and it may be quite difficult to pick out the variables that are substantively important from those which, by chance, appear to be important in any given sample. One way of reducing the risk is to split the pilot sample in half, estimating the relationships from half the sample and testing it on the other half.

If this procedure turns out to yield sensible looking results, it may constitute a relatively inexpensive method of obtaining accurate estimates of national wealth in the form of household tangible assets. It would also go a long way toward reducing the potential conflict between the aggregates-distributions and the analytical uses of the data. If a limited number of predictors turn out to give sufficiently good results (i.e., not much residual variance), the regression-sample procedure would be less burdensome to the bulk of the respondents than would any alternative. (It is true, of course, that the procedure puts a very heavy burden on households in the pilot sample from which the predictor variables are selected.) Consequently, the limits of respondent cooperation and patience would probably not be stretched for the large national sample for whom only the indicator data plus other primary output would be obtained; hence additional information—of purely behavioral significance—might also be obtainable from the sample. In our view, experimentation with the regression procedure is well worth while and should be started quickly in order to test feasibility.

#### ACCURACY AND VALIDATION

Assuming that household wealth estimates can and will be collected, the question arises: How accurate are the data that have been obtained? The usefulness of wealth data, like any other data, is drastically reduced if the data are inaccurate. Accordingly, we feel that some portion of the resources invested in the collection of wealth data should be invested in methodological studies of two types. The first type, to be undertaken before large-scale data collection is begun, would have as its purpose the selection of data collection methods most likely to be accurate. The second type, to be undertaken concurrently or after large-scale data collection, would be used to measure the accuracy of the data-collection techniques actually used. The second type of methodological investigation would correspond in intent and achievement to estimates of sampling errors which accompany any respectable investigation utilizing survey methods.

Resources probably would not permit the undertaking of accuracy studies for all variables for which data are collected, nor would this be desirable. Accuracy studies should be attempted for variables

roughly representative of each major class of information, e.g., house values (representative of real estate), television sets (large household durables), savings accounts (intangibles), etc.

In terms of current technology, accuracy studies fall under three headings: (1) validation studies or record checks, (2) differential performance studies, (3) aggregative comparisons. Of these three the validation study is most precise: errors in survey reports are measured directly by making case-by-case comparisons of individual responses to survey questions with records of (presumably) known accuracy. This technique has been utilized for such variables as savings accounts, automobile installment debt, personal loans, and house values. For the first three of these items the comparison is between the "true" value—obtained from the records of financial institutions, with the owner's estimate of value. In the case of house values the comparison is between owner estimates and those of professional appraisers, since there is no necessary presumption that "truth" is synonymous with appraiser estimates.

In the differential performance approach the same type of data are collected by alternative techniques under circumstances where there is a strong presumption as to which technique is superior. The study provides evidence with respect to the effect of technique on accuracy. This approach is of greater value for initial selection of techniques of data collection than for ex post evaluation of accuracy.<sup>8</sup>

Comparisons of survey-implied aggregates with independent estimates—presumably from production data or from financial institutions—are of less usefulness for a wealth inventory study because information on distributions constitutes a major objective. Annex A discusses some of the major problems encountered in arriving at comparable universes for survey and independent estimates of intangible wealth items.

While it is impossible to suggest specific methodological studies in advance, it is clear that we would fail in our responsibility to users of wealth data if we failed to recommend a substantial investment in accuracy studies.

## VI. SUMMARY OF RECOMMENDATIONS

1. A comprehensive survey of household units is needed in order to obtain better estimates of both the aggregate value and the distribution of tangible wealth in the household sector.

2. The optimal survey design cannot be determined from the information presently at hand. Consequently, a sizable portion of the available resources should be devoted to pilot studies of survey design and accuracy studies of the wealth data obtained from surveys, before a full-scale survey is put into the field.

3. It is probable that the most efficient survey design will involve use of a number of different samples of households, each concentrated on a particular category of wealth. As a minimum, it seems clear that very differently structured samples will be necessary to obtain efficient estimates of tangible, as compared to intangible, wealth; because of the

<sup>8</sup>The approach was used by Neter and Waksberg to measure the impact of length of recall period, telescoping (placing an event in an incorrect time period), different respondents in the household, and other factors on the accuracy of reporting of expenditures for additions, improvements, and repairs to houses.

heavy demands on respondents made by a comprehensive wealth inventory, it is also likely that a number of samples will be needed for tangible wealth alone.

4. Further study should be given to the possibility of estimating the tangible wealth holdings of individual families from specified characteristics of the family. That is to say, it may be possible to predict tangible wealth with reasonable accuracy from data on house value, age of household head, ownership of particular items, etc. In that event there would be no need for multiple samples, since only the data needed to predict would be obtained from each household.

5. In general terms, a survey of tangible wealth would collect data on ownership, age of item, purchase price when acquired or current market value, and possibly condition and method of acquisition. To make the maximum use of this information it is necessary to have accurate data on price changes and depreciation rates for items of tangible wealth. Since reliable price and depreciation data probably do not exist at present, supplementary studies are necessary and should be actively encouraged.

6. The longer range usefulness of wealth estimates would be furthered if purchase data could be obtained by reinterviewing a year or so after the wealth survey. Although this would constitute a further drain on available resources, it would permit a more accurate investigation of the role of accumulated stocks in purchase decisions than permitted by existing data, and greatly enhance the usefulness of the inventory data.

7. The long-range usefulness of wealth estimates would also be furthered if the data could be made quickly and easily accessible to qualified academic research people. This has not always been the case for basic statistics produced by the Federal Government.

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#### ANNEX A

##### PARTITIONING OF WEALTH ESTIMATES AMONG SECTORS<sup>1</sup>

Accurate partitioning of wealth estimates among sectors is desirable for two reasons: (1) to give an accurate picture of the distribution of wealth by sectors (however defined), and (2) to facilitate the testing of survey-implied aggregates. The latter requires elaboration. Much of our data on wealth in the household sector comes from personal interview surveys. We are greatly concerned with the accuracy of information collected by this technique. One conceptually simple method of testing the accuracy of survey data is to compare survey-implied aggregates with aggregates based on records of all savings institutions for the same universe. In the financial area—savings accounts, for example—aggregates pertaining to the entire universe obtained from the balance sheets of savings institutions tend to be highly accurate. To use these estimates for comparison purposes, however, savings accounts (for example) held by owners not part of the survey universe must be subtracted. In the past, estimates of the excluded universe have been made on the basis of rather fragmentary evidence.

Information on ownership of assets should be obtained in sufficient detail from aggregate sources so that both the objectives above can be achieved. In what follows, the partitioning problems are discussed with reference to two illustrative assets—savings accounts and stockholdings. Analogous problems are encountered in dealing with other assets.

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<sup>1</sup> Prepared by E. Scott Maynes, University of Minnesota and U.S. Bureau of the Census.

*Detail required for accurate partitioning*

The following categories would represent an ideal extent of detail :

- A. Assets Owned by Foreigners (even if elsewhere classifiable).
- B. Financial: Banking—includes commercial and mutual savings banks, credit unions, savings and loan associations.
- C. Financial: Nonbank business :
  - 1. Corporate.
  - 2. Noncorporate.
 

Includes sales finance companies, mortgage companies, security, and commodity brokers and dealers, insurance companies, investment companies, holding companies, mutual funds.
- D. Nonfinancial business :
  - 1. Corporate.
  - 2. Noncorporate—include here accounts used *jointly* for business and personal purposes.
 

Includes manufacturing and mining, contract construction, transportation, communications, other public utilities, wholesale and retail trade, real estate companies, insurance agents, forestry and fisheries, services including professionals.
- E. Farming :
  - 1. Corporate.
  - 2. Noncorporate—include here joint business-personal accounts.
- F. Nonprofit organizations and institutions :
  - 1. Educational and research organizations and institutions.
  - 2. Religious and charitable organizations and institutions.
  - 3. Hospitals, sanatoriums, convalescent and rest homes, etc.
  - 4. Clubs, trade associations, etc.
- G. Assets held in formal trust by fiducial individuals and organizations.
- H. Assets of deceased persons—include assets where *all* listed owners are deceased
- I. Persons living in institutions—include persons in prisons, mental institutions, hospitals, on military reservations, etc.
- J. Personal assets—all assets not counted in A through I above.

Category J, it should be noted, is the universe utilized in most sample surveys. In partitioning, different problems are encountered for different assets. Therefore, bank accounts and stockholdings are discussed separately.

BANK ACCOUNTS <sup>2</sup>

To attain accurate partitioning, it is necessary (1) to draw sophisticated samples of account owners and then (2) to allocate this sample accurately to the categories above. As soon as the problem is posed, we are confronted with several important questions: (1) Can the required information be obtained from existing institutional files? (2) Where is the allocation to be done and by whom—in the offices of banks by their clerks, or in the Census Bureau or Federal Reserve Board by their clerks? (3) If more information must be obtained, who is to collect it, and how? We will consider these questions in turn.

*Can the required information be obtained from existing files?*

My judgment, based upon examination of samples of accounts from mutual savings banks and savings and loan associations, is that with the exceptions mentioned below the names and addresses of account owners are sufficient to permit accurate allocation of accounts to categories A–J above.

*Personal versus business-professional versus joint use.*—Clearly, instances exist where wholly business accounts are listed as though they are personal accounts. For example mutual savings banks are prohibited by law from accepting business accounts. It is not uncommon, I am told, for a person seeking a business savings account to be told to take out an account in his own name. Thus, an account with "George Papastathopoulos" listed as owner—apparently a personal account—may, in fact, be the business account for the Orange Grocery Store, owned by Mr. Papastathopoulos.

<sup>2</sup> Includes checking accounts and savings accounts of all types in all types of savings institutions.



It is also likely that some accounts used by farmers chiefly for "farm business" purposes may be listed with no hint of the business usage.

On the opposite side, ostensibly business accounts may be used, to a greater or lesser extent, for personal purposes.

I would propose that a pilot study be conducted in several cooperating financial institutions, designed to ascertain whether these types of problems are quantitatively trivial or important. The object could be accomplished by having the banks send postcards inquiring about account usage to samples of (1) apparently personal owners, and (2) apparently business-professional owners. The simple postcard questionnaire would ask the owner to indicate the extent to which the account was used for personal versus business purposes. Naturally one would use a telephone followup to keep nonresponse at an acceptably low level.

*Corporate versus noncorporate businesses.*—In some instances the fact of incorporation may not be apparent from the business name as it appears on bank records. The "solution" would appear to be simple: consultation of some directory or a telephone inquiry to ascertain the correct status.

*Accounts owned by deceased persons.*—This category is pertinent only to the comparison of institutional and survey aggregates.

We may first note that there exists a considerable lag between time of death and receipt of notification of death by banks. In the Savings Account Evaluation Study, being conducted by the Census Bureau, persons listed as account owners were found to have died as long as 10 years earlier. What's more, banks acknowledge the existence of permanently unclaimed accounts with certainty; they are usually, by definition and in practice, excluded from the survey universe.

A similar type of problem exists with respect to estates in probate. I do not know whether banks are informed of all probate actions involving their depositors. On the survey side, no survey yet conducted has *explicitly* collected information on *bank accounts* constituting a portion of the assets of an estate in probate. The aggregate value of accounts in this category could be ascertained only by a study which sought to track down all owners and their heirs.<sup>3</sup>

As far as estates in probate are concerned, we have no knowledge on the survey side concerning the extent to which respondents report *as their own* savings accounts which they expect to inherit, but which have not yet been legally transferred to them.

Thus, institutional data will tend to underestimate the accounts owned by deceased persons and/or in probate. For the most part, such accounts will by definition be excluded from the survey universe. The problem of how to estimate the total amount of such accounts is complex and deserves further study.

*Who classifies and where?*—To perform the necessary classification three items are required for each sample account: (1) The name of the account owner(s), as shown by institution records, (2) the owner's address, and (3) the account balance. These clearly constitute confidential information which banks must protect. The statistical output, aggregated tables shorn of names, is however, not confidential. The problem: How to achieve accurate classification and summarization without violating confidentiality.

One alternative is to ask sample institutions to provide sample lists (names, addresses, and balances) to an organization such as the Census Bureau. Here the institution relays confidential information; the information is protected by law and by well-developed confidentiality procedures. From the viewpoint of accuracy this alternative has the advantage that clerks can be carefully selected and trained so as to assure uniform treatment of data.

The second alternative—that utilized in the FRB's demand deposit surveys, incidentally—asks the institutions to perform the classification and summarization tasks themselves. The advantage: Information in its confidential form never leaves their hands. Further, clerks can utilize local knowledge. The disadvantage: Statisticians have no control over selection and training of clerks, nor over the quality of their performance.

Given a choice, I would opt for the former. Whether institutions would be willing, I do not know.

<sup>3</sup> Experience with surveys of bank depositors suggests that a small group of depositors—maybe as high as 10 percent—cannot be located.

*The collection of additional information.*—Who does it? For the personal versus business case and the deceased persons case, it appears that only the financial institutions themselves would have the requisite entree to carry out a thorough investigation of the type needed. The planning, of course, should be the responsibility of professional research people.

#### Sampling

For saving institutions with automatic data-processing systems (computers or punchcard systems), the most satisfactory way of drawing a sample of accounts is by specifying the terminal digits of account numbers. For institutions with manual bookkeeping systems, samples may be specified either in the terms of terminal digits of account numbers or in terms of the segments of the alphabet in which depositors' names fall. I would propose to specify a sampling plan in terms of terminal digits, where possible, and by alphabetic segments elsewhere.

The cost of drawing a sample would be nominal for any automatic system and probably not excessive for manual systems.

Lists of financial institutions for sampling purposes are readily available, as follows:

Institution	Source of list	Measure of size available?	Coverage
Commercial banks.....	Federal Reserve Board.....	Yes.....	Complete.
Mutual savings banks.....	National Association of Mutual Savings Banks.	Yes.....	Complete.
Savings and loan associations.	Federal Home Loan Bank Board.....	Yes.....	Covers 96 percent of associations, 99 percent of deposits.
Credit unions.....	Presumably from Credit Union National Association, Madison, Wis.	(?).....	(?).

Our interest here lies in estimates of aggregates. It can be shown that different size-of-account classes should be sampled with different sampling fractions, so as to make the following ratio constant:<sup>4</sup>

$$\frac{\sigma_i}{f_i}$$

where  $\sigma_i$  equals the standard deviation of a particular size class and  $f_i$  equals the probability of selection of accounts in size class  $i$ . In other words, sampling fractions should be varied in proportion to the standard deviation of accounts in that class. This, of course, implies extensive "oversampling" of large accounts.

The number of institutions to be drawn—and the appropriate number would have to be worked out—could be minimized by drawing institutions with probabilities proportional to some measure of size (e.g., aggregate deposits).

#### STOCKHOLDINGS

Three times since 1956 (1956, 1959, and 1962) the New York Stock Exchange in collaboration with the Alfred Politz Organization has conducted "censuses" of shareowners. The two major outputs have been (1) estimates of aggregate value of stockholdings, for certain important classes of owners, and (2) descriptive data regarding the characteristics of stockholders. The vehicle for this study has been an alpha-segmental sample of the files of public corporations, brokerage houses, and mutual funds.<sup>5</sup> To obtain information on shareowners

<sup>4</sup> Hansen, Hurwitz, and Madow, "Sample Survey Methods and Theory," p. 209.

<sup>5</sup> For a description of the methodology of the study, see New York Stock Exchange, Department of Research and Statistics, "Methodology and Sample Design of 1962 Census of Shareowners" (obtainable from Eugene Price, Director of Market Research, New York Stock Exchange).

(each of whom may own more than one "batch" of stock) rather than stockholders of record (each of whom owns only one "batch" of stock in one corporation), the stock exchange undertook an elaborate matching operation to unduplicate the names in its sample. Since the study was conducted partly to promote the "stockholder democracy" image, information on the value of stock owned by individuals was not collected.

In the censuses of stockholdings, aggregates were obtained for the following categories of owners:

1. Foreign stockholders.
2. Domestic stockholders:
  - (a) Male individuals (males owning stock in their own names).
  - (b) Female individuals.
  - (c) Joint accounts—individuals (more than one person holding stock in their own names).
  - (d) Fiduciary individuals (individuals constituting guardians for other individuals; executors and administrators of estates).
  - (e) Fiduciary institutions (banks and other nonindividuals acting as fiduciaries).
  - (f) Stockbrokers and securities dealers (persons or organizations except banks, who purchase and sell securities for their own account or for the account of others).
  - (g) Nominees (partnerships, individuals, and organizations other than stockbrokers and securities dealers who hold stock on behalf of beneficial owners—either individuals or institutions).
  - (h) Institutions (corporations, foundations, colleges, and universities, insurance companies, investment companies, pension funds, and other financial and nonfinancial organizations).

Can these categories be translated into the categories listed at the beginning of this memorandum? The answer is that for categories 2 (e) and (h) above, relatively minor modifications in the questionnaire addressed by NYSE to sample corporations would achieve the necessary translation. For categories (f)–(g) a more drastic departure would be necessary. What is needed is a breakdown of the securities held by brokers and nominees on behalf of other persons. It would be necessary for them to classify each holding, value the holding, and then sum the numbers and values for each category. The workload would be considerable, and it would seem feasible only on a sample basis. Further, it is clear that steps would have to be taken to assure no violation of confidentiality.

In sum, categories (e)–(f) represent a formidable problem while categories 2 (e) and (h) appear readily solvable at minimum cost, assuming that the NYSE continues this program.

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## ANNEX B

### LISTING OF TANGIBLE ASSETS

The following comprise a listing of the sort we think will be necessary to build up estimates of household wealth. These lists are neither complete nor wholly consistent, since we do not view our role as setting forth detailed specifications as to exactly which pieces of information must be obtained on a wealth inventory.

## I. MAJOR HOUSEHOLD APPLIANCES

Mechanical refrigerator	Dehumidifier
Icebox	Room-type air-conditioning units
Freezer	Dishwasher
Cookstove:	Space heaters, heating stoves
Gas or electric	Washing machine
Kerosene, etc.	Mechanical clothes dryer
Wood, coal	Vacuum cleaner
Electric waxer-polisher	Sewing machine:
Garbage disposal	Electric or treadle

II. SMALL HOUSEHOLD DURABLES AND APPLIANCES<sup>1</sup>

Category and item	CES code	National accounts equivalent category
Minor appliances.....	3275	Household operation.
Hot plate.....	3275-10	Kitchen and other household appliances—china, glassware, tableware and utensils.
Electric.....	3275-11	
Gas.....	3275-12	
Other.....	3275-13	
Electric toaster.....	3275-18	
Other electrical kitchen equipment: Frying pan, deep fryer, rotisserie, coffeemaker, mixers, waffle irons, etc.	3275-19	Other durable housefurnishings.
Electric iron.....	3275-39	
Heaters.....	3275-40	
Electric.....	3275-41	
Gas.....	3275-42	
Other.....	3275-43	
Electric fans.....	3275-59	
Other housewares:		
Glasses.....	3276-18	
Dishes (sets).....	3276-20	
China, earthenware.....	3276-21	
Plastic.....	3276-22	
Other.....	3276-23	
Dishes (separate pieces).....	3276-30	
Cups and saucers.....	3276-31	
Plates.....	3276-32	
Others.....	3276-33	
Serving pieces (bowls, pitchers).....	3276-40	
China.....	3276-41	
Glass.....	3276-42	
Silver.....	3276-43	
Other.....	3276-44	
Knives, forks, spoons, etc.....	3276-50	
Silver, sterling.....	3276-51	
Plate.....	3276-52	
Stainless steel.....	3276-53	
Other.....	3276-54	
Cooking utensils, nonelectric (pots, pans, skillets, etc.).....	3276-68	
Bottles, nipples, sterilizers, bottle warmers.....	3276-69	
Kitchen wares.....	3276-70	
Crockery and glassware.....	3276-71	
Kitchen knives, forks, spoons.....	3276-72	
Beaters, spatula and others.....	3276-73	
Miscellaneous items:		
Baby perambulators.....	3277-10	
Carriages.....	3277-16	
Strollers.....	3277-17	
Other nursery equipment.....	3277-29	
Lamps.....	3277-39	
Typewriter.....	3277-49	
Fireplace equipment (shovels, poker, screen, etc.).....	3277-58	
Clocks, pictures, vases, figurines, bric-a-brac, etc.).....	3277-59	
Luggage.....	3277-60	
Hand.....	3277-61	
Trunks.....	3277-62	
Lockers.....	3277-63	
Scissors, scales, thermos bottles, lunch kits, etc.....	3277-78	
Blinds, window shades, rods, etc.....	3277-79	
Household items:		
Lawn mowers.....	3277-91	
Other hand and power tools, garden hose, rakes, spades, carts, sprayers, etc.....	3277-92	
Other outdoor household items, garden tractor, snowplow.....	3277-94	
Other miscellaneous housewares.....	3277-99	

<sup>1</sup> Prepared by Division of Living Conditions Studies, Bureau of Labor Statistics, U.S. Department of Labor.

III. RECREATION DURABLES<sup>2</sup>

Recreation:		
Television.....	3711-10	Radio and TV records and musical instruments.
Radio.....	3711-20	
Phonographs and tape recorders.....	3711-30	
Hi-fi components, kits and parts.....	3711-48	
Phonograph records and recording tapes.....	3711-50	
Musical instruments:		
Piano and organ.....	3711-60	
Violin, clarinet, etc.....	3711-78	
Other: Sheet music, music stands.....	3711-88	
Trailer.....		
Boat:		
Powered.....		
Other.....		
Swimming pool:		
Built-in.....		
Movable.....		

<sup>2</sup> Same source as above.

## IV. CLOTHING

## MEN AND BOYS

Overcoats, heavy storm coats	Separate trousers and slacks, by fiber
Topcoats	Sweaters
Raincoats	Shirts
Heavy jackets	Street and dress shoes
Lightweight jackets for outdoors	Work shoes
Year-round and winter suits	Sport shoes (participant)
Summer suits	Clothing for sportswear
Separate suit coats, sports jackets	

## WOMEN AND GIRLS

Heavy coats, no fur	Separate suit coats
Blouses, shirts	Extra jackets
House dresses	Shoes for street or dress
Sweaters	Fur coats, jackets, capes, stoles
Slacks, shorts, etc.	Heavy sports jacket
Lightweight coats, capes, toppers	Suits
Heavy coats with fur	Dresses other than house dresses
Separate skirts	Shoes for participant sports

V. MISCELLANEOUS DURABLES<sup>1</sup>

Category and Item	CES Code	National accounts equivalent category
Toys and sporting equipment:		
Tricycles.....	3716-03	Recreation—wheel goods, durable toys, sports equipment, boats, pleasure aircraft.
Wagons, skates, sleds.....	3716-04	
Mechanical toys.....	3716-05	
Children's playground equipment.....	3716-07	
Other toys and equipment.....	3716-08	
Sporting equipment:		
Hunting and fishing equipment.....	3713-04	
Other sports equipment (exclude uniforms and shoes).	3713-05	
Hobbies:		
Camera.....	3715-01	Included in durable toys and sport equipment.
Other photographic equipment (films, etc.).....	3715-02	
Collections (coins, stamps, etc.).....	3715-03	
Electronic instruments and amateur radio (except hi-fi).....	3715-04	
Crafts, woodworking, model building.....	3715-05	
Other hobbies.....	3715-07	
Books and art objects:		
Books, nonschool, nontechnical:		Books and maps.
Pocket edition.....	3722-01	
Hard-bound books.....	3722-03	
School and technical books, supplies and equipment.....	3732	
College and professional.....	3732-01	
Other school levels.....	3732-02	
Schoolbooks and supplies (away from home).....	3735-02	
Art objects (see small household durables, 3277-59).		
Tools and home maintenance tools (see small household durables, 3277-92).		Tools included in other durable house-furnishings.
Jewelry and watches:		
Men and boys, 16 and over.....	3317-49	Jewelry and watches.
Boys, 2 to 15.....	3327-49	
Women and girls, 16 and over.....	3337-69	
Girls, 2 to 15.....	3347-59	
Children under 12.....	3357-49	
Other durable items, not auto, not house furnishings and equipment, not furniture, not clothing:		
Eyeglasses.....	3524-12	Ophthalmic products.

<sup>1</sup> Same source as above.

ANNEX C<sup>1</sup>

LISTING OF INTANGIBLE ASSETS

Intangible assets	Nonfarm household	Unincorporated business, except farm	Farm household
Liquid assets:			
Currency.....	(3)	(3)	(3)
Checking accounts (demand deposits).....	X	X	X
Savings accounts.....	X	X	X
In banks.....	X	X	X
In savings and loan associations.....	X	X	X
In credit unions.....	X	X	X
In postal savings.....	X	X	X
U.S. savings bonds.....	X	X	X
Debt instruments:			
Other U.S. bonds, bills, notes, certificates.....	X	X	X
State or local bonds or notes.....	X	X	X
Foreign government or corporation bonds or notes.....	X	X	X
Private U.S. corporation bonds, notes, debentures.....	X	X	X
Mortgages on land contracts.....	X	X	X
Loans to businesses.....	X	X	X
Loans to nonprofit institutes.....	X	X	X
Loans to related individuals.....	X	X	X
Loans to unrelated individuals.....	X	X	X
Trade credit.....	X	X	X
Consumer credit.....	X	X	X
Other loans.....	X	X	X
Common or preferred stock.....	?	?	?
Preferred stock:			
Publicly traded.....	X	X	X
Not publicly traded.....	X	X	X
Common stock:			
Publicly traded.....	X	X	X
Not publicly traded.....	X	X	X
Equity in mutual finance organizations.....	X	X	X
Other intangibles:			
Life insurance paid up value.....	(3)	(3)	(3)
Other intangible assets.....	(3)	(3)	(3)
Pension and retirement funds.....	(3)	(3)	(3)
Liabilities:			
Consumer debt—			
On houses.....	X	X	X
Mortgages and land contracts.....	X	X	X
Home repair and modernization.....	X	X	X
Other.....	X	X	X
Auto debt.....	X	X	X
Durable goods other than autos.....	X	X	X
Medical.....	X	X	X
Other.....	X	X	X
Loans on securities.....	X	X	X
Trade debt.....	X	X	X
Debt to individuals.....	X	X	X
Other debt to institutions.....	X	X	X

ADDITIONAL CANDIDATES FOR ASSET CATEGORIES

- Cash value of annuities.
- Commodity contracts.
- Beneficial interest in estates in probate.
- Cash value of royalties.
- Oil or real estate syndicates.
- Value of patents, copyrights.
- Value of "going concern" (business or professional practice, trade, farm operation).

<sup>1</sup> Prepared by Charles Lininger, Survey Research Center, University of Michigan.

<sup>2</sup> Collection possibility uncertain.

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APPENDIX II: PART D  
REPORT OF THE WORKING GROUP ON NET FOREIGN  
CLAIMS

Prepared by ROBERT L. SAMMONS

MEMBERSHIP OF THE WORKING GROUP ON NET FOREIGN CLAIMS

John F. Bennett, Treasurer's Department, Standard Oil Co. of New Jersey.

Prof. Arthur I. Bloomfield, Wharton School of Finance & Commerce, University of Pennsylvania.

Prof. Isaiah Frank, School of Advanced International Studies, the John Hopkins University.

Milton W. Hudson, Morgan Guaranty Trust Co.

Charles Mansfield, Western Hemisphere Division, International Monetary Fund.

Samuel Pizer, Balance of Payments Division, Office of Business Economics.

Robert L. Sammons (secretary), Division of International Finance, Board of Governors of the Federal Reserve System.

John E. Reynolds (ex officio), Committee for Balance of Payments Statistics, Bureau of the Budget.



## PREFACE

The Working Group on Net Foreign Claims met twice, on September 17 and December 10, 1963. The first session was devoted to a general discussion of principles and data problems. At the second session, a preliminary draft of the report was considered. Subsequently, the members of the group read and commented on a second draft; however, final responsibility for the report rests with the secretary.

While all members of the group made substantial contributions, the deliberations were aided especially by the participation of Messrs. Pizer and Reynolds, who, because of their close professional connection with the subject matter, were exceptionally cognizant of the intricacies of existing data. Joel Popkin and John W. Kendrick, of the staff of the Wealth Inventory Planning Study, attended the meetings of the working group and made many helpful suggestions. Finally, the cooperation of Eleanor J. Stockwell, secretary of the Working Group on Nonfarm Business Financial Claims, is also gratefully acknowledged.

ROBERT L. SAMMONS.

## NET FOREIGN CLAIMS

### I. INTRODUCTION

Traditionally, national wealth has been defined as including all tangible assets located within the geographic limits of the area the wealth of which was being measured, plus (or minus) an adjustment variously referred to as "net foreign claims," "net foreign investments," "international," or the like. An estimate of the latter, in substantially the form needed for a national wealth estimate, is now being published annually by an agency of the U.S. Government.<sup>1</sup> The data are known to be incomplete in some respects, and the bare figures conceal knotty problems of a conceptual as well as statistical nature. Nevertheless, the estimates go a long way toward meeting any reasonable standards for inclusion in national wealth estimates, and all users of such data must be grateful to the Balance of Payments Division, Office of Business Economics, U.S. Department of Commerce, for having inaugurated and carried forward these interesting and valuable data for so many years.

The Working Group on Net Foreign Claims has directed its attention to the following major aspects of its assignment:

1. Some alternative measures of "net foreign claims," with respect to: (a) whose assets and liabilities should be considered; (b) what assets and liabilities should be considered; (c) what values should be placed on those assets and liabilities.

2. What classifications of types of claims, and U.S. creditor or debtor sectors, would be needed to permit integration with the remaining segments of the national wealth estimates, and at the same time would be useful for other purposes.

3. A careful examination of the present estimates prepared by the Department of Commerce with a view to evaluating both their accuracy and the extent to which they conform to those concepts and classifications for which the working group expresses a preference.

4. Recommendations for changes and improvements, both in the collection of data and their presentation.

### PRINCIPAL RECOMMENDATIONS

The major recommendations of the working group, with respect to conceptual and definitional aspects, are summarized in the following paragraphs:

1. All claims on nonresidents as well as equity in tangible property located abroad (except movable military property) should be included as "international claims" in the national wealth estimates.

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<sup>1</sup>The latest data, for the end of 1962, may be found in an article by Samuel Pizer and Frederick Cutler, "U.S. International Investments," Survey of Current Business, August 1963, pp. 16 ff.

2. Puerto Rico should *not* be counted as part of the United States in making national wealth estimates, thus making the latter consistent in coverage with the gross national product data.

3. The unpaid, but not formally repudiated or forgiven, obligations to the U.S. Government arising out of World War I should not be included in the national wealth estimates. Nor should claims payable in foreign currency if the employment of that currency is restricted in such a way as to make it not essentially different from local currency counterpart funds generated by grant aid.

4. In principle, marketable portfolio securities should be carried in the data at market value; other debt at face value; direct investment, whether in the form of equities or debt, at book value according to issuers' books, adjusted to reflect depreciated replacement cost of underlying tangible assets. Some members of the working group expressed a preference for valuing all debt at face value.

5. The U.S. monetary gold stock should be treated as if it were an international asset. Foreign-owned gold held under earmark in the United States, or held elsewhere, should, however, not be treated as a foreign claim on the United States.

6. Claims on foreigners should be allocated to the sector owning the claim, even if the loan is guaranteed by some other sector of the U.S. economy.

The major recommendations regarding data collection are summarized below. For this purpose, the economy has been divided into three major sectors: (1) Households, (2) government, and (3) corporations, partnerships, and all other businesses and institutions for which balance sheets are ordinarily, or could be, prepared.

### *Households*

It is unlikely that any substantial amount of foreign claims on the United States takes the form of liabilities of U.S. households, and the working group believes that any census of foreign claims on the United States could ignore this possibility.

On the other hand, portfolio holdings of foreign securities by the household sector are undoubtedly large. The present estimates of all U.S. portfolio holdings of foreign stocks and bonds rest on extremely shaky foundations; moreover, they do not distinguish by sector of ownership. Therefore, an estimate of *household* assets in this class would have to be based on a special inquiry. Two possibilities emerge.

1. A complete census of all foreign assets of all U.S. residents, or of private households separately. This would be an extremely costly operation, might be politically unpopular, and might have psychological repercussions on the international position of the dollar. It is, therefore, not recommended by the working group.

2. A sample inquiry, based on a procedure in which the coverage of high-income families, and possibly other groups, such as foreign-born residents, was relatively much greater than of other income groups.

3. An alternative to either proposal, which could be undertaken with far less publicity, would be to confine the census to, or select the sample from, those persons claiming credit for foreign income taxes on U.S. income tax returns, form 1040. It would even be possible to use the tax returns alone, although the problem of converting income data to capital values would undoubtedly be formidable.

The secretary and several members of the working group felt that the third method might yield the best results. However, the second alternative, presuming such an inquiry could be incorporated as part of a broader survey of assets of households, also would merit serious consideration.

#### *Government*

The foreign claims of the U.S. Government can be obtained from Government records; the data are published regularly by the Department of Commerce. It is understood that data on real fixed assets of the U.S. Government abroad are also available on the same valuation basis as similar assets located domestically. The value of Government-owned movable property located abroad is apparently not separately known.

It seems unlikely that State and municipal governments have any significant foreign assets, but the only way to be sure would be by inquiry, perhaps through the Census Bureau's surveys of local governments.

On the *liabilities* side, present estimates of all foreign holdings of U.S. Government securities, and short-term State and municipal issues, seem reasonably adequate, although they include essentially only those securities held in custody by domestic financial institutions and brokers. No data are presently collected on *holdings* of long-term municipals; as in the case of private securities, present reports cover *transactions* only.

The following procedures could be used to improve on present data; the working group, however, is recommending only that they be considered.

1. A report on long-term municipals held in U.S. custody accounts.

2. Reports by paying agents of municipal and Federal *registered* issues as to foreign holdings.

3. A more drastic method would be to require an ownership certificate with all coupons cashed (on bearer issues) during a census year.

#### *All Other Sectors*

All private economic entities except households would be requested to file balance sheets as part of a national wealth survey, according to recommendations being prepared by the working group on claims. In such balance sheets, foreign assets and liabilities would be reported separately at both book and market values. If such balance sheets were prepared so as to leave foreign subsidiaries *and branches* out of the consolidation, which our working group recommends be done, the data obtained would be suitable for measuring the foreign assets and liabilities of the covered institutions, subject to the following reservations.

1. The investment in foreign branches and subsidiaries should be included at book value *as reflected on the foreign books*, preferably adjusted to reflect the depreciated replacement cost of the underlying real assets. This would require a supplemental schedule for such investments; in effect, a continuation of the Commerce Department's direct investment surveys.

2. The payer, or debtor, corporation cannot always identify the real owner of its publicly offered securities. Supplemental information would have to be collected, using one or more of the methods outlined below.

3. Since a principal use of international investment data is to help in preparing balance-of-payments estimates, the working group recommends that any balance sheet survey include a request for income paid or received during the most recent calendar year on each of the foreign items reported.

4. Since for many purposes, the country distribution of our international investments is useful, supplementary requests for this information should be made if large items not covered by current reporting requirements are disclosed. However, it is likely that most of the significant types of international assets and liabilities are in principle covered by existing reporting requirements, except for foreign portfolio investments in U.S. securities, and U.S. portfolio investments in foreign securities. With respect to the former, a substantial amount of detail by country of ownership can be obtained by analyzing withholding tax returns. Likewise, a considerable amount of information as to the source of foreign income reported on both personal and corporate income tax returns appears in the returns, but the cost of extracting it would be extremely great. And reference has already been made to the difficulty of converting from income data to capital values if this source were used.

The additional data needed, as mentioned in paragraph 2 above, might be collected in the following manner.

*Bonds, bearer (foreign holdings of registered bonds could presumably be reported on the balance sheet).*—The only method of obtaining relatively complete data would be to require the filing of an ownership certificate with every interest coupon cashed during a period of, say, 1 year. These certificates would be signed by the owner or his authorized agent, certifying the owner's country of residence. Such certificates are already being filed with the Internal Revenue Service.

Bonds on which no interest was paid during the census year would not, of course, be amenable to this procedure, nor—so far as the working group sees—to any other.

*Stocks.*—Foreign holdings of U.S. stocks registered as such on the books of issuing corporations would be reported on the balance sheet. A separate report would have to be filed by domestic nominees (mainly banks and brokers) acting for foreigners. Alternatively, a substantial amount of information on foreign holdings can be obtained from an analysis of withholding tax returns filed by the nominees.

## II. THE CONCEPTUAL FRAMEWORK

## "Domestic," "national," or "supernational" wealth

The working group believes that the traditional concept of "national" wealth is the most logical one; namely, all the physical (tangible) assets located within the geographic boundaries of the country ("domestic" wealth), *plus* physical assets located abroad but owned by domestic residents,<sup>1</sup> *plus* claims on residents of other countries owned by domestic residents, *minus* domestically located physical assets and claims on residents owned by residents of other countries. Such a definition is generally consistent with the standard definition of the gross national product,<sup>2</sup> and the "plus" and "minus" items are analogous to the international investment income item which accounts for the difference between *national* and *domestic* product.

But even this definition contains at least three imprecise elements which may be worth mentioning.

First, what are the appropriate geographic boundaries? The national product data cover only the 50 States and the District of Columbia. The international investment figures of the Commerce Department, being derived mainly as a byproduct of balance-of-payments estimates, treat the customs area of the United States as domestic territory. The only significant present discrepancy, for our purposes, between the two definitions is the Commonwealth of Puerto Rico; but before they became States, Alaska and Hawaii were also omitted from the GNP calculations, although counted as domestic territory for balance-of-payments purposes. The working group recommends consistency with the GNP definitions for national wealth purposes, although it sees no objection to the Balance of Payments Division's continued publication of data consistent with the balance-of-payments statistics. From a purely economic point of view, it might be more appropriate to secure this consistency by including Puerto Rico in the national GNP estimates, but there are serious objections—mainly of a political nature—to this procedure. However, it is likely that the Puerto Rico Planning Board has, or can obtain, sufficient information on mainland investments in Puerto Rico and Puerto Rican investments on the mainland to make a satisfactory adjustment to the Commerce Department estimates.<sup>3</sup>

Secondly, should a sort of implied principle of extraterritoriality be applied with respect to tangible (real and personal) property owned by governments outside their own frontiers? For instance, should foreign embassies in the United States (and the buildings owned by international organizations) (a) be ignored entirely in estimating U.S. national wealth, or (b) should they be considered as part of *domestic* wealth, and adjusted out of *national* wealth via the net foreign claims entry? A similar question arises, *a fortiori*, regarding U.S. military property abroad. While a decision on this matter must be essentially an arbitrary one, the working group favors alternative (b) as far as national wealth estimating is concerned. Again, it sees

<sup>1</sup> See next page.

<sup>2</sup> The major exceptions are Government and consumer assets, not treated as investments in the U.S. gross national product statistics as presently constructed. See footnote 5.

<sup>3</sup> The necessary information could also be obtained, of course, as part of any general census or other inquiry into the international investments of the United States.

no objection to the Commerce Department's continuing to omit these items from its statement of the international investment position of the United States; such a treatment is, as a matter of fact, consistent with both balance-of-payments and national product statistics, as presently constructed.<sup>4</sup>

The third ambiguity in our definition relates to the question what natural persons are to be considered residents. The rule used in balance-of-payments estimating is that all persons "ordinarily" living in a country are considered to be residents thereof, except that citizens of a country serving their own government overseas are considered residents of the country of their citizenship. Citizens living abroad but not working for their own government would be counted as residents of the country where they live.

Some members of the working group were in favor of a broader definition, to which the term "supernational" might be applied; namely, *all residents* of the country plus *all nonresident citizens*. Such a definition was employed by the U.S. Treasury Department in its census of U.S.-owned property abroad,<sup>5</sup> but would not be consistent with national income and balance-of-payments practices. Moreover, it would result in the same assets being counted as part of the national wealth of more than one country.

If another complete census of foreign assets were to be taken, it would probably be useful to cover again "all persons subject to the jurisdiction of the United States," even if it were decided, for statistical purposes, not to include the property of citizens permanently residing abroad as part of the national wealth. The assets of nonresident citizens might well be estimated and shown in a footnote as a contingent item, since for tax and other purposes such persons are subject to the jurisdiction of the United States.

The present methods of estimating probably fail to reflect the assets *in the United States* of U.S. citizens residing abroad as "foreign" investments in the United States, and the working group foresaw that some problems of a political or public relations nature could well arise if a census of such assets were taken for the specific and only purpose of *excluding* them from the "national" wealth; that is, in order to be able to include them in *foreign* investments in the United States.

#### WHAT CONSTITUTES AN "INTERNATIONAL" ASSET OR LIABILITY?

In the construction of national balance sheets, it is customary to distinguish between "real assets" on the one hand and "claims" (including shares and other equities) on the other. However, the distinction is not always an easy one to make, and for many purposes it is useful to impute a "claim" where the property is, from a legal point of view, held directly. For instance, the assets (and liabilities) of sole proprietorships are usually included in the enterprises sector, with

<sup>4</sup> This is true because all Government expenditures on goods and services are treated as current expenditures in the national product statistics, and, if made abroad, are treated as imports in the current account of the balance of payments. When the Federal Government spends money on military construction abroad, the expenditure appears in the gross national product statistics (positive) as a Government purchase of goods and services, but is also included as an import (negative) in the current account of the balance of payments. The net effect is to show no gross national product and no net foreign investment as a result of such expenditures.

<sup>5</sup> U.S. Treasury Department, "Census of American-Owned Assets in Foreign Countries," Washington, D.C., 1947.

the net equity treated as a claim on the enterprises sector by the household sector. Owner-occupied residences may be handled in the same manner; if that is done, consumer durables become the only "real" assets (in the private sector) "directly" held by their owners.

The working group favors treating all tangible assets, real estate, and movable property, located in one country but owned by residents of another, as international claims, and thus part of the "domestic" wealth of the country of location but part of the "national" wealth of the country of ownership. (The only exception would be movable military property; since much of such property is subjected to frequent and large-scale shifts of location, it seems logical to consider all of it as part of the "domestic" wealth of the country of ownership.)

There are some international debts which have never been formally repudiated, but which seem so unlikely ever to be paid that it is unrealistic to include them in national wealth estimates at this time. Private investments in Cuba may be in this class; at least the Department of Commerce has omitted them from its latest estimates. Similarly, the intergovernmental debts arising out of World War I, long in complete default (except for that of Finland), have generally been omitted from the official statistics, latterly without even a footnote calling the user's attention to the fact.<sup>6</sup>

On the other hand, \$490 million of U.S. Government claims on Japan in settlement of postwar aid were included in the data for the first time in 1962, the year in which a settlement agreement was signed. Obviously, some sort of a claim had existed, and was acknowledged by the Japanese Government, during the years intervening since the end of World War II, but it would have been impractical to put a precise figure in the tables.

Perhaps some of these problems are similar to those encountered in determining what domestic assets are to be included in national wealth. Buildings in an abandoned mining town, even though structurally sound, may have no economic value as long as the town is effectively abandoned, but if the mine reopens, or the town becomes a tourist center, they may come to have value again.

#### PROBLEMS OF VALUATION

"Domestic" wealth is ordinarily considered to consist of all the real, or tangible, assets in a country, although it is sometimes limited to reproducible assets. The question of intangible assets frequently arises, especially the value of human capital, and what might be called the excess of the "going concern" value of the economy over the value of its physical assets taken separately. This "surplus" value is compounded of a complex of many factors—de jure or de facto monopolies, goodwill, quality of management and administration, external economics, and many others.<sup>7</sup>

<sup>6</sup> As of June 30, 1963, the balance on such debts, including accrued interest, was in excess of \$20 billion. See U.S. Agency for International Development, "Foreign Debts Owed to the U.S. Government and Certain International Organizations," Washington, D.C., 1963.

<sup>7</sup> The excess of market value of claims, especially common stock, over the value of the underlying assets can be used as a measure of the "going concern" or "surplus" value just mentioned. For a suggestion along this line see Vernon L. Smith, "The Measurement of Capital," appendix I, part H.



If this intangible aspect of wealth is to be omitted from the estimates, the superstructure of claims and equities which overlies the real assets that compose the national wealth can, in a closed economy, be ignored. The net balance of all such claims and equities is zero, if valued at the same value on debtors' books and in creditors' portfolios. It is, of course, possible to value these claims in various ways—face value, market value, book value as registered by "debtors," book value adjusted to reflect adjustment of the "debtors" real assets to some base other than the one employed by the debtor, and many others. However, the value of national wealth will not be affected by the method used to value claims; only the method used to value the underlying real assets is significant.

However, in the measurement of net international assets, since these can, as we have seen, most logically be thought of as claims, the question of valuation becomes all important, and it is to this subject that we now turn our attention.

Three basic methods of valuation—book, market, and face—have been used by the Department of Commerce in estimating the net international investment position of the United States.

1. *Book value* has been applied to direct investments, those in which the owner has a significant entrepreneurial interest. This means value as shown on the books of the debtor, or owned, enterprise. This value, in turn, is obviously determined by the way in which the "debtor" values its own assets, presumably in most cases cost less depreciation for fixed assets, cost or market for inventories (or cost, on a last in, first out or first in, first out basis), and face value for financial claims (or cost or market, if equities in other enterprises are held). In the case of U.S. direct investments abroad, exchange rate problems enter, at least with respect to financial assets and liabilities denominated in foreign currencies.

2. *Market values* have been used to value portfolio holdings of stocks and bonds for which organized markets exist.

3. *Face value* governs short-term debt, as well as most long-term nonmarketable debt, including the foreign loans made by the U.S. Government.

Some members of the working group, including the secretary, expressed a strong preference for valuing international claims at market value, wherever possible. International creditors, as a group, can only realize on their foreign claims by selling them to residents of the debtor country, or of some country other than the creditor country. Therefore, present market value, which presumably represents what a willing buyer would pay a willing seller under existing conditions, is the best measure of what an international investment is worth to the creditor country. Market value seems especially appropriate in the case of portfolio holdings of stocks and bonds which are traded on organized security markets.

It is recognized that, in the case of equities and direct investments, market value may be quite different from the value of the underlying tangible assets. To take a simple example: the real assets of a corporation—adjusted to a depreciated replacement cost basis and after allowing for net financial assets—may be such as to impart a book value per share of \$100, but the market value of the shares may be \$200. If the shares are owned by nonresidents, the effect of valuing such shares at

market value is to "subtract" from domestic wealth of the debtor country, to arrive at national wealth, a larger amount than was included in domestic wealth to start with. But this excess may be regarded as a legitimate foreign claim against the wealth of the Nation as a whole, rather than against any particular real assets.

On the other hand, in the case of a creditor country like the United States, it is likely that its *net* international assets would be greater relative to total national wealth if valued at market prices than if valued at the (depreciated replacement cost) value of the underlying real assets.

The following basic principles of valuation, which are essentially those employed by the Commerce Department, are therefore recommended:

1. Claims payable in money: market value, if available; otherwise face value.

2. Real assets: depreciated replacement cost.

3. Equities: market value except for direct investments; for the latter, book value according to issuers' books, adjusted to reflect depreciated replacement cost of underlying tangible assets.

Some special problems in applying these principles and the majority views of the working group regarding their solution are discussed in the following pages.

*Equities, direct investments.*—Even if it were preferable to use market values for all assets, it is usually impossible to obtain a market value in the cases of subsidiaries and branches. In the case of branches, no securities representing the home office ownership exist; and in the case of 100 percent subsidiaries, no market for the shares exists. Even if some minority holdings are present, for which there is a market, it can be argued that their value may be quite different from the one that would exist if all shares were publicly held. Moreover, the value of such investments is affected by the nature and extent of the parent-subsidiary relationship; the concept of a "pure" market value is extremely elusive.

However, there is much to be said for trying to adjust the book value of such investments to reflect the depreciated replacement cost of the underlying real assets, thus making the value of the investment in some measure comparable to the value assigned to real domestic assets. In the case of foreign direct investments in the United States, such a procedure should be feasible if the value of domestic real assets, so adjusted, is calculated for each company.<sup>8</sup> But to attempt this procedure for direct investments of U.S. residents abroad would require collecting data on the nature of the assets owned abroad, and their date of acquisition or construction, similar to that collected for domestic real assets. And it would involve the application of price indexes, for purposes of converting to present values, that would, in many cases, be very difficult to obtain.

In these circumstances, the working group considers that the method followed by the Department of Commerce in the past is the most practical alternative available, with respect to U.S. investments abroad, and that the value of foreign direct investments in the United

<sup>8</sup> A similar treatment, of course, could be provided for miscellaneous foreign portfolio investments in domestic corporations, and would then logically be applicable to U.S. portfolio investments in foreign stocks. It would, however, be completely impractical for U.S. holders of foreign shares to obtain the necessary data.

States should continue to be calculated in the same manner for the sake of consistency.

However, the group also recommends that, as part of a complete census of national wealth, an attempt be made to collect sufficient information to permit showing the value of direct investments on both bases.

*Government loans at special interest rates.*—In general, the working group favors including financial claims payable in money at market or face value. A special situation arises, however, in the case of loans made by the U.S. Government to foreign governments and other foreigners at extremely low rates of interest. (The discussion in this section applies only to loans payable in dollars.) It can be argued that an estimate of the present value of such loans ought to take into account the difference between the stipulated rate of interest and the "going" rate.

But what should be considered the "going" rate for this purpose? At least two major possibilities may be considered. The first would be the rate charged by the Export-Import Bank, at present  $5\frac{3}{4}$  percent per annum. Since this represents the highest rate charged by the U.S. Government on foreign loans payable in dollars, the present value of loans made at lower rates, discounted at  $5\frac{3}{4}$  percent, might be considered to represent their current real value for purposes of national wealth estimating.

Another possibility would be to use the cost of money to the U.S. Government for equivalent terms as the discounting factor, which would produce a higher value than the use of  $5\frac{3}{4}$  percent, since interest on even the longest term U.S. Government loans is less than  $5\frac{3}{4}$  percent. However, many foreign loans are now being made for terms longer than the longest outstanding Government bonds; some of these loans could, perhaps, even be left out of the accounting entirely as being substantially equivalent in their entire amount to grants. However, conditions change over time, and many of these loans may some day be repaid.

It was recognized that this procedure would tend to undervalue, in a sense, the postwar loans to Europe made at low interest rates, some of which are being repaid ahead of schedule, at full face value. However, if new loans were to be made now to these same debtors, they would not likely bear less than the  $5\frac{3}{4}$  percent rate of interest; such a rate may, therefore, be a reasonable one to use in calculating their present value.

In support of this point of view, it may be noted that the market ordinarily recognizes changes in the general level of interest rates by revaluing bonds and other interest-bearing securities payable in money. The foregoing suggestion represents, in effect, an extension of that principle.

The majority of the working group, however, favored valuing such debts at face value, in accordance with the basic principle already enunciated, while recognizing discounted present value as a defensible alternative.

*U.S. Government loans payable in foreign currencies.*—The U.S. Government has followed two basic procedures in making so-called soft loans. One is to make loans payable in dollars, but with very low interest rates and exceptionally long terms and grace periods. The other is to make loans payable in the debtor's currency, with the express

or implied understanding that the repayments will not be converted into foreign currency, directly or indirectly, without the consent of the debtor. Such loan agreements may or may not contain a maintenance-of-value clause; if not, they are subject to having their dollar value decline if the debtor's currency is depreciated. In any event, the prospect of the U.S. Government receiving repayments on such loans in a form that would result in a net credit to the U.S. balance of payments is obviously remote, to say the least.

The working group recommends that the claims represented by such loans not be considered as part of the national wealth of the United States, but that they be considered as a memorandum item or contingent asset—to be mentioned in a footnote or an accompanying text.

These are the valuation problems that seem worthy of special mention; in the detailed listing of assets and liabilities in part III of this report, the method of valuation presently in use will be described, together with the working group's views thereon.

#### PROBLEMS OF CLASSIFICATION

The following is suggested as a minimum breakdown by type of claim, although, for some purposes, obviously more detail would be useful.

1. Gold (asset only).
2. Currency.
3. Deposits at banks:
  - (a) Demand.
  - (b) Time.
4. Other short-term claims:
  - (a) Money market instruments.
  - (b) Other.
5. Long-term debt:
  - (a) Marketable bonds.
  - (b) Other.
6. Direct investments:
  - (a) Subsidiaries and affiliates.
  - (b) Branches.
7. Other equities:
  - (a) Marketable stocks.
  - (b) Other.
8. Real assets:
  - (a) Consumer durables.
  - (b) Real estate.

Probably the content of each of these suggested rubrics is unambiguous enough; in any event, the extent to which the existing estimates conform to these categories will be discussed in part III, and in the process a more detailed description of each will emerge.

The troublesome question of monetary gold stock can be solved in one of several ways:

1. Consider it a domestic asset, not to be included in net claims on the rest of the world. This is the solution customarily followed in most national wealth estimates.<sup>9</sup>

<sup>9</sup> E.g., Raymond W. Goldsmith, "The National Wealth of the United States in the Post-war Period," Princeton, 1962, p. 69.

2. Treat the domestic gold stock as an international asset, and all the gold held by foreign monetary authorities wherever located as an international liability. Although this is compatible with the treatment adopted in the official flow-of-funds statistics prepared by the Federal Reserve Board, it seems somewhat unrealistic. The nature of a financial claim is that it can only be extinguished by a transfer of real goods; the United States can pay off (net) foreign debts only with an export surplus or by selling gold. On the other hand, if exports are exchanged for gold, one asset has been traded for another—a debt has neither been created nor extinguished. Under this treatment, a consolidated statement of total world wealth would not include monetary gold.

3. Treat the domestic gold stock as an international asset, but ignore foreign-held gold. This is not essentially different from (1) and has the merit of showing that gold is an asset, and part of the national wealth, only because of its ability to command foreign goods and services. True, it is only a generalized and not a particular claim; in fact, it is not really a claim at all, but simply a special kind of asset with an unlimited foreign market at a fixed price. Nevertheless, the working group recommends this treatment, which is consistent with the treatment of gold in the balance-of-payments statistics.

The classification of international claims by U.S. debtor or creditor sector is necessary to produce a complete matrix of the network of claims that represent title to the real assets of the economy plus claims on abroad. Thus, the degree of sectoring depends on the degree of detail desired for this matrix—a point on which the judgment of this working group should not be controlling. However, the following sectoral classifications would appear to be minimal:

1. Households.
2. Agriculture.
3. Nonfinancial business, including sole proprietorships, and non-profit institutions.
4. Financial corporations:
  - (a) Commercial banks.
  - (b) Other.
5. Government:
  - (a) Federal Government.
  - (b) Federal Reserve System.
  - (c) Other.

Most of the feasible methods for collecting data would easily provide this sector breakdown, and many finer divisions that might be desired. By their nature, of course, claims can be classified only on a company, not an establishment, basis. But most of the information, whether collected by census-type enumerations or as a byproduct of tax collection or other administrative processes, would be available for individual firms, and hence, amenable to whatever sectoral classifications might be desired. Again, we shall comment on this aspect when we discuss the existing data.

For many purposes, it would be desirable to have a breakdown by major foreign countries or areas of our international assets and liabilities. Also, it is useful to have some breakdown by foreign sector of

ownership, especially of short-term claims on the United States; holdings of monetary authorities and commercial banks are of particular interest. However, these refinements are not of direct interest for national wealth measurement.

We turn now to points 3 and 4 mentioned on page 475; that is, a detailed discussion of the data presently available and our recommendation for collecting new or better data as part of a national wealth census in or about 1970, or by other means.

### III. DATA EVALUATION AND RECOMMENDATIONS

In examining the existing data, it is convenient to focus on the data for 1962, published in the August 1963 issue of the "Survey of Current Business."<sup>1</sup> For convenient reference, an elaboration of the Commerce table<sup>2</sup> is reproduced below, with the lines numbered to facilitate easy reference. Only the 1962 data for the world as a whole are reproduced; the original table contains data for 1950 and 1961, and for major geographic areas. Annual estimates are available for all recent years.

We shall discuss assets and liabilities separately, although in some cases, where common sources are used, this will involve repetition.

#### INTERNATIONAL ASSETS OF THE UNITED STATES

##### 1. Gold

Data on gold holdings of the U.S. Government are published regularly in the Federal Reserve Bulletin and elsewhere. The gold is valued at its statutory price of \$35 per ounce.

##### 2. Currency.

The Commerce data do not include an estimate for U.S. holdings of foreign currency; that is, paper money and coin. The difficulty of collecting data on such holdings is obvious; but with so many persons stationed abroad whose assets should be included in U.S. national wealth, the figure may not be a negligible one. On the other hand it seems highly unlikely that, under present circumstances, any significant amounts of foreign currency are physically held in the United States itself, aside from small balances held by banks and dealers in foreign currencies.

The working group recommends that, as long as large numbers of U.S. civilian and military personnel are stationed overseas, the national wealth estimates include an allowance for their holdings of foreign currency. Since the amount involved would probably not be large, fairly rough estimating procedures would be appropriate. Two possibilities suggest themselves:

(a) A sample survey, using the panel of respondents which, it is understood, the Department of Defense maintains for other inquiries.

(b) Estimate total (United States and foreign) currency holdings of personnel stationed abroad by applying national averages,

<sup>1</sup> Samuel Pizer and Frederick Cutler, "U.S. International Investments." See especially table 9, p. 18.

<sup>2</sup> Provided by Mr. Pizer, a member of the working group.

stratified, to the extent possible, by income level. Prorate between holdings of United States and foreign currency using as an index the ratio of sales in PX's and commissaries to estimated expenditures in the foreign economy.

TABLE 1.—*International investment position of the United States, 1962*

[Millions of dollars]		
1.	U.S. assets and investments abroad, total.....	80,126
2.	Private investments.....	59,810
3.	Long-term, total.....	52,576
4.	Direct <sup>1</sup> .....	37,145
5.	Foreign dollar bonds <sup>2</sup> .....	6,373
	Other foreign securities:	
6.	Stocks.....	4,715
7.	Bonds.....	714
	Other long-term:	
8.	Reported by banks (form B-3).....	2,151
9.	Reported by commercial concerns (C-2).....	769
10.	Other <sup>3</sup> .....	709
11.	Short-term assets and claims, total <sup>4</sup> .....	7,234
12.	Reported by banks (B-2).....	5,038
13.	Reported by commercial concerns (C-2).....	2,111
14.	Brokerage balances.....	85
15.	U.S. Government credits and claims.....	20,316
16.	Long-term <sup>5</sup> .....	16,040
17.	Foreign currencies and short-term claims <sup>6</sup> .....	3,113
	Monetary assets:	
18.	IMF position.....	1,064
19.	Convertible currencies.....	99
20.	Foreign assets and investments in the United States, total.....	47,368
21.	Long-term.....	20,201
22.	Direct <sup>7</sup> .....	7,597
23.	Corporate stocks <sup>8</sup> .....	10,336
24.	Corporate, State, and municipal bonds <sup>9</sup> .....	657
25.	Other long-term.....	1,611
26.	Reported by banks (B-3).....	4
27.	Reported by commercial concerns (C-1).....	161
28.	Other <sup>10</sup> .....	1,446
29.	Short-term assets and U.S. Government obligations.....	27,167
30.	Private obligations.....	13,340
31.	Reported by banks (B-1) <sup>11</sup> .....	12,583
32.	Reported by commercial concerns (C-1).....	645
33.	Reported by brokers (S-4).....	112
34.	U.S. Government obligations.....	13,827
35.	Long-term marketable issues <sup>12</sup> .....	2,061
36.	Special nonmarketable nonconvertible issues.....	251
37.	Short-term.....	11,515
38.	Bills and certificates <sup>13</sup> .....	9,331
39.	Foreign-currency certificates.....	48
40.	Currency.....	906
41.	Miscellaneous <sup>14</sup> .....	1,230

<sup>1</sup> Country and industry detail in August 1963 Survey of Current Business.

<sup>2</sup> Detail by country and class of borrower being developed.

<sup>3</sup> Represents values carried forward (with adjustments) from the Treasury census (TFR-500) for certain types of assets, including real estate, estates and trusts, insurance, and miscellaneous claims. The major adjustment was to eliminate part of the value of real property abroad reported by individuals who at the time were noncitizen residents of European origin.

<sup>4</sup> Stabilization fund credits (\$62,000,000) are subtracted from the B-2 reports and included in Government assets.

<sup>5</sup> Detail as in "Foreign Grants and Credits" except that the latter excludes (1) contributions to international organizations (other than IMF) of \$1,117,000,000, (2) non-military installations abroad, \$71,000,000, and (3) miscellaneous claims and settlements, \$101,000,000.

<sup>6</sup> Detail by program and country in "Foreign Grants and Credits."

(Additional footnotes on page 489.)

Foreign currency holdings of corporations and other businesses would be reported on the balance sheets which would be filed by such organizations, if the recommendation of the working group on claims is followed.

Foreign currency belonging to the U.S. Government should also be included, but official records probably do not readily provide the data separately from holdings of foreign money in the form of bank deposits. The working group sees no great advantage in separating the two.

### 3. Deposits in banks.

It will be convenient to describe the data presently collected on deposits in banks abroad according to the various economic sectors listed on page 486. With the rapid growth of the so-called Euro-dollar market, this item is obviously of much greater magnitude than just a few years ago. A separation of demand from time deposits would be useful for many analytical purposes, though not strictly needed for national wealth estimates. Moreover, like most forms of short-term capital, deposits can be a very volatile item; changes (which represent capital movements in the balance of payments) cannot be accurately measured except by reporting procedures which cover almost the whole universe.

(a) *Households and agriculture.*—No information is currently available regarding deposits in foreign banks by the household sector, including U.S. Government personnel abroad.<sup>3</sup> This omission, together with the probable omission of other foreign investments of the household sector, no doubt contributes to the "errors and omissions" item in the balance of payments. Clearly, therefore, a census of national wealth should include some provision for estimating this component. Two major possibilities seem to exist.

(1) A complete census of all foreign assets of U.S. residents, similar to the 1943 Treasury census on form TFR-500, could be conducted, covering bank deposits as well as all other foreign assets or claims. To be successful, such a census would have to be compulsory, and would have to be given extensive publicity. If the U.S. balance of payments were still in deficit at the time of the census, widescale apprehension that the census was a prelude to

<sup>3</sup> Deposits placed abroad through U.S. banks are required to be reported by the latter on Treasury Foreign Exchange Form B-2 (see below), but are not separately identified.

<sup>7</sup> Area data in August 1963 "Survey of Current Business": industry breakdowns can be derived from that article and "Foreign Business Investments in the United States."

<sup>8</sup> Certain country details are available, but are not accurate. Industry data are available only for earlier years.

<sup>9</sup> Transactions data do not segregate by type; corporate bonds predominated in Treasury census (TFR-300).

<sup>10</sup> Represents value carried forward from the Treasury census (TFR-300) for real property, estates and trusts, insurance, and miscellaneous debts and claims.

<sup>11</sup> Derived as follows:

Total reported on B-1.....	\$25, 023
Less:	
U.S. bills and certificates.....	12, 343
U.S. foreign currency certificates.....	48
IMF deposit.....	49

<sup>12</sup> As published in "Federal Reserve Bulletin," with minor adjustments.

<sup>13</sup> Excludes IMF holdings (\$3,012).

<sup>14</sup> Includes special issues to international organizations, military procurement accounts, and other liabilities of U.S. Government agencies.

NOTE.—The designations in parentheses refer to Treasury Department reporting forms. See annex.



exchange control would probably arise, and the impact on the international status of the dollar might be catastrophic. The working group does not believe that the need for data on national wealth is sufficiently great to justify such a procedure in the foreseeable future.

(2) A more feasible procedure, also not without its dangers, would be to include a question on foreign deposits (and other foreign assets) as part of a more general inquiry designed to determine the value of household assets. Presumably such a survey would be conducted on a sample basis. The working group commends this to the consideration of the working group on consumers' assets.

(3) An alternative to either proposal would be to confine the inquiry to those persons (or a sample of them) reporting foreign income on income tax returns 1040. It might even be feasible to amend form 1116, used to claim credit for foreign income taxes paid, for the census year to obtain all the necessary information. Of course, investments on which no income was received (or no foreign tax credit claimed) would be missed by such a procedure.

(b) *Nonfinancial business, other than agriculture.*—Foreign bank deposits of such businesses, together with those of some financial corporations (but not U.S. banks), are reported on the U.S. Treasury's Foreign Exchange Form C-1/2, and the supplement thereto, described in the annex. Deposits payable in foreign currencies, included in line 13 of the table, amounted to \$217 million on December 31, 1962. Deposits payable in dollars were not separately reported.

The quarterly form, C-1/2, is required from all "nonbanking" firms whose foreign assets and liabilities exceed a certain minimum. However, the segregation of deposits from other short-term assets is required only if the deposits are payable in foreign currency. Deposits payable in dollars are included in a broader category of other short-term claims. But the firms with large holdings are required to file a monthly supplement (see annex), on which deposits payable in dollars and foreign currencies are reported separately with each category further segregated between demand and time deposits. Form C-1/2 is required from "nonbanking" firms, that is, from firms not required to file reports on the Treasury foreign exchange forms B-1 and B-2 (see below). The C-1/2 reporters include some firms which should be classified as financial rather than nonfinancial businesses. However, since individual reports are available, presumably any desired segregation by type of business can be undertaken.

The working group has no basis for judging whether or not the data collected in this form are reasonably adequate for a national wealth inventory. However, it is understood that the Working Group on Claims is recommending that, for the year in which a national wealth census is undertaken, all private economic entities except households be required to file balance sheets. These balance sheets would provide for a far more detailed classification of assets and liabilities than we are recommending, and for a separation between domestic and foreign claims.

This recommendation, if followed, would provide substantially all the information needed to measure the net international claims of the reporting institutions. The reports thus received would also provide

benchmark data and information needed to supplement the present lists of organizations filing the Treasury foreign exchange forms described in this report.

Therefore, any other recommendations made herein for improvement in the existing system, or for other means of supplementing that system, should be considered to be in lieu of, and not in addition to, the balance sheet reports just mentioned.

(c) *Financial corporations.*—Aside from deposits in foreign banks reported by those financial corporations filing reports on Treasury forms C-1/2, foreign deposits owned by commercial banks and other financial corporations are reported on the Treasury Foreign Exchange Form B-2 (see annex). This form is filed by all “bankers and banking institutions” in the United States, including U.S. branches, agencies, subsidiaries, and other affiliates of foreign banks, whose claims on foreigners exceed a certain minimum amount. Only deposits payable in foreign currencies are shown separately on the forms; these amounted to \$0.4 billion on December 31, 1962, and are included in line 12. Deposits payable in U.S. dollars are included in an “all other” category. However, it is believed that the institutions reporting on this form do not have substantial amounts of foreign deposits payable in dollars. Except for the lack of coverage due to the cutoff exemption, it appears that this report provides as much information as it is probably feasible to obtain, but the general balance sheet survey would uncover any omissions.

For various purposes, it would be highly desirable to segregate commercial banks—those institutions whose assets and liabilities are included in the “all bank” statistics published by the Federal Reserve Board—separately from other financial institutions. This would be feasible since the individual reports are available in the various Federal Reserve banks, to which the reports are rendered. However, to the (unknown) extent that assets belonging to clients are included on this form the sector classification would, of course, be incorrect. The proposed balance sheet survey would require these institutions to report their own assets only.

(d) *Government.*—U.S. Government-owned deposits in foreign banks are basically of three types. The first is what might be called normal deposits—working balances in foreign currencies, ordinarily purchased with dollars but also acquired from sales of surplus agricultural products, but in any case, freely usable to meet the normal operational expenses of the Federal Government. Second are the convertible currency holding of the stabilization fund, considered to be part of the international monetary reserves of the country. The third category consists of holdings, the use of which is restricted by agreement with the foreign country concerned to purposes which, in general, would not substitute for dollar-financed U.S. Government expenditures abroad, and thus would not aid the U.S. balance of payments. Examples of such deposits include the proceeds of surplus property sales abroad, sales of surplus agricultural products, repayments of loans in foreign currencies, and the like (unless the foreign currencies can be used without restriction to meet U.S. Government expenditures or for other purposes).

With respect to U.S. Government holdings of “soft” currencies, that is, currencies the use of which is restricted, the working group

suggests that they be treated in the same way as foreign currency loans (see p. 484); that is, that they not be considered as part of the national wealth of the United States, but that they be carried as a memorandum item or contingent asset—to be mentioned in a footnote or in an accompanying text.<sup>4</sup>

Information regarding both of these types of holdings of foreign deposits are obtained regularly by the Commerce Department, and are included in line 17 of the Commerce Department's table. Among other claims here included are the loans made by the Treasury's stabilization fund and the loans on gold collateral made by the Federal Reserve System, although these are not, of course, "deposits."

Since it began direct operations in foreign currencies in 1962, the Federal Reserve Bank of New York, acting as agent for the Federal Reserve System, holds foreign currencies as a result of its swap operations with foreign central banks. These currencies are ordinarily held in the form of deposits; full information regarding the amount is published from time to time in the Federal Reserve Bulletin. These, together with convertible foreign currency holdings of the Treasury (not all of which, however, are held in the form of deposits), comprise the \$99 million of line 19.

It seems unlikely that any State or local government holds any significant amount of foreign deposits (or any other foreign claim). However, in the wealth census year, the customary survey of State and local government finances could include a question on foreign assets.

#### 4. *Other short-term claims*

For purposes of balance-of-payments analysis, it would be desirable to separate this category into (a) what might be called loosely money market instruments, and (b) all other short-term claims. In discussing the various sectors, we shall indicate to what extent a breakdown between money market instruments and other types of short-term claims is presently available.

(a) *Households and agriculture.*—No direct information is available on foreign short-term assets owned by these sectors; the position is essentially the same as described above with respect to deposits. However, it seems unlikely that such holdings would be significant, with the exception of bank deposits, already discussed. If a complete census or sample survey of foreign assets of these sectors were to be undertaken, requests for data on these assets would presumably be included.

(b) *Nonfinancial business, other than agriculture.*—As in the case of deposits, short-term claims on foreigners by nonbanking institutions are required to be reported on the Treasury Foreign Exchange Form C-1/2. The Treasury Department and the Federal Reserve System have made strong efforts to expand the coverage of this form in recent years, and several hundred new reporters have been added. The reporting instructions are sufficiently explicit to cover many of the types of assets or liabilities that would result from the well-known phenomena of leads and lags in foreign trade payments. Thus, an

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<sup>4</sup> Some members of the working group felt that a special committee might be appointed to evaluate such assets on a case-by-case basis, with a view to setting values thereon that could be included in national wealth estimates.

advance payment by an American exporter or a credit extended in connection with American exports should be reported on this form. However, the size and variability of the errors and omissions item in the balance of payments are such that there seems to be reason to expect that such capital movements, as well as deposits in banks, are not being fully reported. The following peculiarities of the data may be noted:

(1) As already stated, the companies reporting on form C-1/2 include both financial and nonfinancial concerns; but the amounts reported by nonfinancial businesses can be obtained by special tabulations.

(2) Trade bills forwarded for collection through commercial banks are reported by the banks on form B-2 instead of by the exporters, or other creditors, on form C-1/2. On form B-2 they are combined with collections outstanding for the bank's own account; to obtain an accurate sectoring, a special survey would have to be undertaken to make the separation. However, in all probability the collections reported by the banks on form B-2 are mainly for the account of customers; probably the error involved in attributing the total to the nonfinancial sectors would not be great. The amount involved at the end of 1962 was \$0.7 billion; this is included in line 12. Collections payable in foreign currencies are not reported separately from other foreign currency claims.

(3) Short-term claims of parent companies on their foreign subsidiaries or affiliates are not included in this category, but under direct investments. Although some companies make an effort to segregate their advances to their subsidiaries between short- and long-term claims, many do not, and in any event, whether the claim is short term or long term can frequently only be determined after the fact. The total amount reported on form C-1/2 at the end of 1962, other than deposits payable in foreign currencies, was \$1.9 billion, of which \$1.7 billion was payable in dollars (line 13). The balance sheet proposal would, of course, provide more complete coverage of this item.

(c) *Financial corporations.*—The existing data with regard to short-term claims, other than deposits, of financial corporations are those obtained on the Treasury forms B-2 and C-1/2, to which reference has already been made. The separation between commercial banks and other financial institutions is not made in the published statistics but can be determined, as already indicated, by retabulating the data from the original reports. These report forms are described in the annex. The total amount of claims reported on form B-2, other than deposits payable in foreign currencies, was \$4.8 billion at the end of 1962 (line 12). Of this, \$4.6 billion was payable in U.S. dollars, and \$0.2 billion was payable in foreign currencies.

Another Treasury foreign exchange form, S-4, is designed to collect data on foreign debit and credit balances in accounts of U.S. brokers. The amount of assets reported on this form as of December 31, 1962, was \$0.1 billion.

Complete coverage of this sector, too, in the census year would be provided by the proposed balance sheet survey.

(d) *Government.*—Holdings of short-term claims of the Federal Government on foreigners, aside from deposits, consist mainly of the gold tranche position in the International Monetary Fund—equal to the U.S. quota in the Fund, minus the Fund's holdings of U.S. dollars. The implication of this treatment is that any drawings by the United States would be treated as a reduction in U.S. Government claims on abroad up to the amount of the gold tranche plus any drawings of U.S. dollars by other countries; U.S. drawings in excess of this amount would appear on the liability side of the international balance sheet as a net liability to the International Monetary Fund. Stabilization fund loans and loans by the Federal Reserve System on gold collateral would be included here; as already mentioned, they are entered in line 17 of the table. Again, there seems to be no reason to believe that State and local governments would have any significant amount of short-term claims on foreigners.

##### 5. *Long-term debt*

There is no feasible way, with the information presently available, to segregate portfolio investments in foreign securities—either debt instruments or equities—according to sector of ownership. While the Treasury Department's census of foreign assets, taken in 1943, did provide such information, the only information available which serves to bring these figures up to date is obtained from data on transactions which show no breakdown by nature of the transactor. Moreover, there is no information available regarding transactions between American residents in foreign securities; thus, even if it were possible to know the economic sector of the original purchaser of a foreign security, that would be of little value in determining the present ownership. Again, the only feasible way of obtaining a sector breakdown of holdings of miscellaneous foreign securities is through a census-type inquiry, and such an inquiry would have to cover all types of holders, not just households. The latter might be covered by a sample survey; corporate and institutional holdings would probably have to be reported in full if adequate data are to be obtained. This would be accomplished, as far as nonhousehold assets are concerned, by the proposed balance sheet survey.

Private holdings of portfolio foreign debt securities are valued, insofar as feasible, at current market values. Nonmarketable types of debt are valued, in the main, at face value. These principles of valuation accord with the recommendations of this report. In the absence of a sector breakdown, our description of the existing data will be organized according to type of securities rather than sector of ownership.

(a) *Dollar bonds, publicly offered.*—The Commerce Department keeps an individual record of each issue of foreign dollar bonds, publicly offered in the United States, including those of international institutions such as the World Bank. It endeavors to find out, usually by correspondence with the underwriters, the percentage of the issue taken in the United States at the time of issue. The amount of the issue outstanding at any particular time is ordinarily a matter of public record; the amount held in the United States is calculated by applying the percentage of the issue originally sold in the United States to the amount outstanding. Any error resulting from a subsequent

change in the country of ownership is offset by a corresponding error in the estimates of U.S. holdings of foreign bonds other than dollar issues, as explained in detail below. Obviously, this method of estimating can be used to produce either face value or market value.

(b) *Private placements.*—Private placements of foreign securities in the U.S. market are usually made through investment firms and more often than not are publicly announced. Some additional data are obtained from reports to the Securities and Exchange Commission and to insurance commissioners. Again, the Department of Commerce makes an effort to ascertain what part, if any, of each issue is placed with non-U.S. investors. It ordinarily assumes that such issues are paid at maturity, unless information to the contrary comes to the Department's attention. Total U.S. holdings of foreign dollar bonds, publicly offered and privately placed, were estimated at \$6,373 million (market value) at the end of 1962 (line 5).

(c) *Other foreign bonds.*—The estimate for private U.S. investments in foreign bonds, other than those originally offered in the United States, is based on a benchmark obtained by the U.S. Treasury census of foreign assets taken in 1943. This estimate has been brought forward on the basis of data on transactions in foreign bonds between U.S. and foreign residents as reported on Treasury Foreign Exchange Form S-1 (see annex). These reports show transactions at the value at which they take place, and are classified only by country of residence of the non-U.S. party to the transaction; information regarding the nationality of the issuer of the securities involved is not obtained. The basic data reported on form S-1 include new issues and redemptions; adjustment is made to remove such transactions, to the extent they are deemed to involve dollar bonds, from the data before applying the residual to the benchmark estimates. The results are further adjusted, in an extremely rough manner, by reference to indexes of bond prices in those countries, mainly Canada and certain Western European countries, whose securities comprised the major part of U.S. holdings in 1943.

In some years, Canadian data on transactions in foreign securities between the United States and Canada were substituted for the U.S. figures, since the Canadian figures seemed to be more complete. However, no effort has been made to adjust the data for changes in ownership due to migration of individuals, nor to allow for transactions which might have been undertaken by Americans directly with foreign brokers without using the intermediary of a U.S. broker (except to the extent that such transactions accounted for the difference between the United States and Canadian figures in the years in which Canadian data were used).

It is evident from the foregoing that the existing estimates of U.S. private holdings of foreign bonds and other long-term debt (excluding amounts reported on Treasury Exchange Forms B-2 and C-1/2, to be described presently) rest on extremely shaky foundations.

Moreover, the sector distribution of such holdings is not known, although presumably some scattered data could be obtained from published holdings of insurance companies, mutual and pension funds, and the like.

The working group believes that the only feasible way of getting reasonably reliable estimates for such holdings would be the household and balance sheet surveys already described.

(d) *Nonmarketable foreign debt (other than privately placed dollar bonds).*—As already indicated, the Treasury Foreign Exchange Forms B-2 (for banking institutions) and C-1/2 (for reporters other than banks) request information not only on short-term claims but on claims with original maturities of more than 1 year. Treasury Foreign Exchange Form B-3, described in the annex, requires monthly reports on long-term claims on foreigners from all institutions holding such claims in excess of an average of \$500,000 over a 6-month period. Form B-3 was recently inaugurated by the Treasury in order to provide a more detailed breakdown on the types of claims included in this category; formerly all long-term claims were reported only in a single column on form B-2. Also, the C-1/2 form, already described, requires a report of claims on foreigners with an original maturity of more than 1 year, although without any breakdown by type of claim. Long-term claims reported on form B-2 at the end of 1962 amounted to \$2.2 billion; on C-1/2 to \$769 million. These amounts are shown in lines 8 and 9 of the table. It is unlikely that households possess any large amounts of nonmarketable claims; those held by other private entities would be reported on the balance sheet survey.

Some of the problems involved in evaluating U.S. Government long-term claims on foreigners have already been discussed. The Commerce Department assembles and publishes data on such credits and investments in a bulletin entitled, "Foreign Grants and Credits by the U.S. Government." While this report does not distinguish between claims payable in dollars and claims payable in foreign currencies, presumably the basic data are available and any adjustments that might be considered desirable could be made. The data are presented by the Commerce Department in terms of U.S. dollars at face value of the claims. With respect to foreign currency proceeds of surplus agricultural sales and similar transactions, the long-term account includes only the equivalent of the currencies that have actually been loaned to the foreign governments for development purposes; any currencies not yet disbursed for that purpose, but held as liquid cash balances by the U.S. Government, are included in short-term assets. As already indicated, the working group recommends that most of these foreign currency assets not be included in the national wealth estimates. The long-term claims also include the paid-up subscriptions of the United States in international development-lending institutions; however, the net position in the International Monetary Fund, as already indicated, is included among short-term claims.

The working group recommends that loans as well as other investments in foreign countries be allocated to the sector of the economy actually holding the claim, whether or not such loans or investments are guaranteed by the U.S. Government or an agency thereof. This is, in effect, the way commercial bank participation and Export-Import Bank credits are presently being handled; they are reportable on Treasury Foreign Exchange Form B-2 by the bank providing the funds (or on form C-1/2 if the institution providing the funds is not a bank). Direct investments have also been made with guarantees provided by the Agency for International Development. The nature of the guarantees and the extent of the risk covered may vary from case to case. (The working group presumes that similar principles are followed in classifying domestic claims according to sector of ownership.)

### *C. Direct investments*

Estimates of the value of the U.S. direct investments abroad, owned mainly by business firms but also by households, are based on a benchmark survey taken as of 1957, the latest in a series of such surveys taken by the Department of Commerce. The census was compulsory and there is no reason to believe that the coverage was not substantially complete. The data are brought up to date annually using information on transactions with, and earnings reinvested by, foreign branches and subsidiaries obtained on a compulsory basis from a sample of American companies covering approximately 90 percent of the total amount of the investment involved. Allowance is also made for new direct investment abroad by companies not included in the Commerce Department's sample, to the extent information regarding such investment comes to the Department's attention. The sample includes all companies with foreign direct investments valued at over \$2 million, and companies are added to the sample as they reach that level. The value of such investments at the end of 1962 was \$37.1 billion (line 4).

Direct investments, as already indicated, are shown at book value; that is, book value of the American interest in the company as reflected on the books of the foreign enterprise. For the purpose of converting this value to U.S. dollar equivalent, the value of fixed assets and related depreciation reserves is, generally speaking, converted at the exchange rate prevailing at the time the assets were acquired. The value of financial assets and liabilities and inventories is ordinarily converted into U.S. dollars at the rate of exchange prevailing at the time of conversion.

The treatment of subsidiaries and branches is essentially similar. The method followed by the Department of Commerce amounts to taking the total assets of the foreign enterprise (excluding any claims on the home office or the parent company) and deducting therefrom all liabilities due to outsiders as well as any outside equity in the stock (including surplus) or other securities of the company.<sup>15</sup> The resulting figure represents the net equity of the home office of the enterprise.

It is also customary to include in direct investments all interests of American investors in the securities of such enterprises. These holdings could, of course, be included in miscellaneous portfolio securities; if such a procedure were followed they would be included in the Commerce Department estimates at market rather than book values. However, the differences in value would undoubtedly be relatively small and the working group sees no reason for recommending

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<sup>15</sup> Since balance sheet data supplied on U.S. income tax returns form 1120 are frequently used for statistical purposes, attention should be directed to the fact that such balance sheets, in probably all cases, include the foreign assets and liabilities of foreign branches of U.S. companies. It is particularly important, therefore, that if Internal Revenue balance sheet data are used for national wealth estimates, the assets and liabilities pertaining to foreign branch operations included in these figures be eliminated. The most recent censuses of foreign direct investments taken by the U.S. Department of Commerce have included a request for a balance sheet of each foreign enterprise. Although in many cases probably not strictly comparable to the balance sheet data on form 1120, they could be used, if necessary to make the necessary adjustments to the income tax data. The amounts involved are not negligible. Several very large foreign enterprises in the petroleum industry are U.S. incorporated concerns. Moreover, in many cases a U.S. company will form a separately incorporated U.S. subsidiary to operate in one or more foreign companies. The Western Hemisphere corporation provision of the income tax laws, by providing a reduced rate of tax for those companies whose income is from sources without the United States but within the Western Hemisphere, encourages this practice.



a change in the Commerce Department procedure. The sector of ownership of these miscellaneous public holdings is not known.

The working group has recommended that a census of foreign assets of households be undertaken, but it believes that the detail requested should be limited to types of assets and country of location. This would not permit the segregation of those miscellaneous security holdings which, according to definitions now employed, would be considered direct investments. We do not believe that this refinement would justify the much greater effort and cost involved.

As already indicated, the working group also recommends, for the census year, that data be collected to permit the calculation of direct investments adjusted to reflect the depreciated replacement cost of the underlying fixed assets.

The forms used in the census of direct investments in 1957 as well as those used in the annual surveys are described in the annex.

### *7. Other equities*

This item includes corporate stocks, other than direct investments, and a miscellaneous collection of other investments of an equity or quasi-equity character, most of which were uncovered in the Treasury census of 1943.

With respect to U.S. holdings of foreign stocks, the remarks made above with respect to portfolio holdings of foreign bonds apply. The only benchmark data available are those of the Treasury census of 1943. Adjustments to bring this figure up-to-date are based on transactions with foreigners in foreign stocks as reported on the Treasury Foreign Exchange Form S-1. Adjustment has also been made for changes in market values of securities, but this obviously has to be done on an extremely rough basis since the reporting form does not disclose the nationality of the security but only the residence of the foreign partner to the transaction.

In view of the fact that the reporting system does not cover transactions made directly abroad by individuals without going through a U.S. broker and in view of the difficulty in adjusting to current market values, it is evident that the present estimates at best can be considered only a very gross approximation. Here again, the only feasible way of obtaining reasonably accurate data on household assets would be a new census using one of the procedures already described; assets of the rest of the private sector would be covered by the balance sheet survey.

### *8. Real assets*

The term "real assets" refers in this connection only to the properties of households and governments; real assets of business firms can best be considered as branches and treated in the manner already described in the section on direct investments.

Two types of real assets owned by households must be considered. The first is consumer durables owned by persons temporarily residing abroad but who are considered domestic residents for national wealth purposes. These could be considered either as domestic real assets, or as part of net foreign assets. The working group suggests the latter treatment. In all probability the estimates of the value of consumer durables will be made on the basis of household samples, taken either in connection with the population census or under some other cir-

circumstances. In any event, there is no reason to believe that the average holdings of household goods of families residing abroad would vary significantly from the national average of families living in rented quarters.

The second category is residential real estate owned by residents of the United States, including residents temporarily stationed abroad. Again, the only feasible way to obtain information on such holdings would be to take a census. In order to be consistent with the direct investment estimates, the value should be either the cost to the present owner with some reasonable allowance for depreciation, or preferably, estimated current value. In either case, any mortgage debt outstanding should be deducted from the value thus calculated.

The working group recommends a similar treatment for Government real assets. We understand, from the report of the Government Assets Working Group, that reasonably complete and accurate data on overseas real property holdings of the U.S. Government exist. We believe that the same principles of valuation should be applied to such assets as are applied to similar assets located in the United States; it is likely, however, that such values are well in excess of any conceivable amount that might be obtained for the assets if they were resold to foreigners.

Government-owned movable property located abroad should, in the view of the working group, be considered as a "domestic" asset, especially military property, much of which is frequently moved from one location to another. Movable property of civilian agencies might well be handled in a similar manner, especially if the most convenient sources of data fail to disclose geographic location.

#### FOREIGN INVESTMENTS IN THE UNITED STATES

The treatment of foreign investments as "claims" on the United States raises certain technical problems which do not exist with respect to U.S. assets abroad. As to the latter, the investigator can be reasonably arbitrary both with respect to the sector which owns the assets and the value placed on them. He may make errors, of course, but since these figures do not, at least in principle, have to be integrated with any of the other accounts included in the national wealth statement, there can be no question of duplication. Nor will errors in other items result because an item estimated directly (in this case the foreign investments) is deducted from some other figure to arrive at a residual.

On the other hand, foreign claims on the United States constitute a part of the overall matrix of claims and liabilities overlying domestic tangible assets; it is necessary to insure, for instance, that total holdings of stock of American corporations, including foreign holdings, add up to the estimate of total corporate stock outstanding. And if, for instance, it were necessary to estimate consumer holdings of corporate stock as a residual, obviously the accuracy of that estimate would depend on the accuracy of the estimate of foreign holdings.

For purposes of measuring net international claims, the recommended method of valuation would be that which most nearly approximates market value. However, as already mentioned, the use of mar-

ket value may result in the apparent anomaly of "deducting" a larger amount from the domestic real wealth than was included in the first place. This would result, for instance, when the market value of an equity security held by a foreigner exceeds the value of the underlying real assets, even after adjusting the latter to the basis being recommended for national wealth estimates. But, as already indicated this anomaly is only apparent.

It is of some interest, perhaps, that a somewhat similar conceptual problem occurs in national income accounting. Interest on public debt securities, for instance, is ordinarily considered to be a transfer payment in the national income estimates. However, when such interest is paid to foreign holders of the securities, it seems logical not to treat it as a transfer payment, since foreigners have had to surrender real resources to acquire the security, but as an ordinary payment of investment income. This results also in "deducting" from national income an amount which was never "included" in national income in the first place.

Our apparent anomaly, of course, does not apply to domestic claims on foreign countries, since whatever value is placed on them for national wealth accounting purposes is then added to domestic real assets to arrive at total national wealth.

### *1. Gold*

Not applicable.

### *2. Currency*

The Commerce Department includes in its estimates a figure for foreign holding of U.S. currency. At the end of 1962, this amounted to \$0.9 billion. U.S. banks, including Federal Reserve banks, report regularly on foreign shipments and receipts of U.S. currency. However, it is obvious that extremely large amounts must also be carried into and out of the country in the pockets of travelers—both Americans and foreigners—and thus that it is completely impossible to make a reliable estimate of the net movement based on banking transactions. Presumably, even if the incentive to hoard U.S. currency is far less now than it was a few years ago, there must at any time be very large amounts on hand abroad, in banks, in exchange houses, in shop tills, etc. The working group sees no feasible way of coming up with an even reasonably reliable estimate for this item; probably the best thing to do would be to leave it out of the accounts entirely, with a footnote to that effect. It is understood that the Commerce Department is not planning, for the present at least, to change the above mentioned estimate, which has been held constant since 1959.

### *3. Deposits at banks*

The Treasury Department's Foreign Exchange Form B-1, as revised in May 1963, provides for the first time a detailed breakdown of deposits of foreigners in U.S. banks and banking institutions, payable in U.S. dollars, according to demand and time deposits, and according to whether the holders are foreign official institutions, foreign banks, or other foreigners (individuals, partnerships, and corporations). The data are collected monthly and, except for presumably minor amounts not reported because of a minimum reporting requirement, are probably quite complete. The form is described in the

annex. Negotiable time certificates of deposit are not included here, but in "money market instruments."

The institutions reporting on Foreign Exchange Form B-1 include firms which are not "banks" within the general meaning of that term as it is customarily used in U.S. financial statistics; for instance, the data on money supply include the demand deposits liabilities of commercial banks only. The working group recommends, therefore, that as part of the national wealth estimates, deposits owned by foreigners be limited to deposits in "banks"; other items reported as deposits on foreign exchange forms B-1 would be included in "other short-term claims"; it is believed that a substantial part of the amount which would be thus excluded consists of current accounts between U.S. branches and agencies of foreign banks and their home offices, and accounts due by U.S. banks to their foreign branches.

The balance sheet proposed for financial institutions by the Working Group on Claims provides for far more detail than Treasury Exchange Form B-1, and would also serve as a check against the reporting on the latter form.

The total amount reported as deposits on December 31, 1962, was \$10.6 billion,<sup>16</sup> and is included in line 31 of the table including deposits at Federal Reserve banks, which amounted to \$247 million.

#### *4. Other short-term claims*

(a) Money market instruments. We define money market instruments to include publicly offered debt instruments with original maturities of 1 year or less. In the U.S. market, these consist mainly of U.S. Treasury securities, short-term paper issued by commercial and industrial concerns (finance paper), negotiable time certificates of deposit, and bankers' acceptances. Available information on foreign holdings of such paper comes almost solely from the Treasury's Foreign Exchange Form B-1 and, therefore, covers only paper held in custody accounts by reporting institutions. Moreover, while there are separate columns for short-term U.S. Government securities, with the three-way breakdown according to class of foreign holder already described in the case of deposits, foreign holdings of finance paper and bankers' acceptances are included in a column headed "other short-term liabilities" and, therefore cannot be separately identified. It may be noted, however, that a very substantial amount of foreign holdings of this type of paper is represented by accounts for foreign monetary authorities and international institutions at the Federal Reserve Bank of New York. These holdings consist only of U.S. Government securities and bankers' acceptances; the total amounts held for foreign monetary authorities are published regularly in Federal Reserve statements.

A problem arises with respect to the classification of certain non-marketable U.S. Government securities denominated in foreign currencies and issued to foreign official institutions. While most of these securities have original maturities of more than 1 year, practically all of them are convertible into cash on relatively short notice. Although the securities are not marketable, they are obviously freely available in time of need to cover balance-of-payments deficits of their holders, and thus have been included by the Commerce Department in

<sup>16</sup> Treasury Bulletin, February, 1963, p. 95.

the category of "liquid" liabilities, except in those few cases where they have not contained the cash convertibility feature. It is suggested that, in any statement of national wealth, these securities be classified with other short-term government securities maturing in less than 1 year as "money market instruments", although they might also with some justification be included in the next category "other short-term liabilities."<sup>17</sup>

Excluding the latter, total foreign holdings of U.S. Government short-term securities amounted to \$9.4 billion, lines 38 and 39 of the table. Not included are non-interest-bearing, nonnegotiable U.S. Government obligations issued to the International Monetary Fund (although these are included on form B-1). The U.S. Government "investment" in the IMF represented by these notes is also excluded from the asset side of the international balance sheet.

The statistics on foreign holdings of short-term securities of all kinds do not include foreign-owned securities not held in custody accounts with domestic reporting institutions. The reporting requirements include a question regarding actual shipments and receipts of short-term U.S. Government securities between the United States and foreign countries, but the amounts reported under this requirement are completely negligible. In view of the short-term nature of these securities it seems likely that in most cases foreigners would hold them in custody accounts with domestic financial institutions; in any event, the working group sees no feasible way of collecting data on any other foreign holdings that might exist.

(b) *Other short-term liabilities.*—This category includes a variety of liabilities, the data on which are gathered from different sources. The following paragraphs indicate the main items for which data are presently available.

(1) All short-term liabilities reported on Treasury form B-1, other than deposits at "banks" and money market instruments, would be included in this category. This includes data reported in the columns headed "Other short-term liabilities" on the form as well as all liabilities payable in foreign currencies; the form requires no separation of the latter by type of liability. In addition, of course, all liabilities of institutions reporting on Foreign Exchange Form B-1 which are not "banks" would be included in this category. Presumably, all nonbanking firms reporting on this form fall in the category of other financial corporations. However, it is believed that some small amounts of special deposits with the U.S. Treasury Department are also included on this form: if so, they should, of course, be segregated and shown as a U.S. Government liability.

The total amount of nondeposit liabilities reported on form B-1 as of December 31, 1962, which would be included in this category, amounted to \$2 billion (included in line 31). How much of the deposit liabilities should be included here because they are not deposits at "banks" could only be determined by a special tabulation of the B-1 forms.

(2) Short-term liabilities to foreigners reported on the Treasury Department's Foreign Exchange Form C-1/2 are also in-

<sup>17</sup> As of Dec. 31, 1962, there were \$251 million of these special issues outstanding, none of which contained the cash convertibility feature (line 36).

cluded in this category. As already indicated the firms reporting on this form include both nonfinancial businesses and financial corporations; it would be necessary to make this separation in order to provide the desirable classification of liabilities by sectors. The total reported as of December 31, 1962, was \$0.6 billion (line 32).<sup>18</sup>

(3) Credit balances in foreign accounts as shown on the books of U.S. brokers and security dealers and reported on Foreign Exchange Form S-4 are also included in this category. Presumably, all of the reporting institutions would fall in the category of "other financial corporations." The amount outstanding on December 31, 1962, was \$0.1 billion.<sup>19</sup>

(4) Advance payments to the U.S. Government on foreign military contracts. While part of such funds is actually invested in marketable U.S. Treasury securities, the relevant agreements with the foreign governments provide that the money can be used only to make payments on military contracts. For this reason, the movements in such figures have been included in changes in "nonliquid" U.S. Government liabilities in the balance-of-payments statistics, serving, when they rise, to reduce the deficit in the U.S. balance of payments rather than to finance it. They are, however, classified as short term in the Commerce Department's international investment table. It seems appropriate, therefore, in the national wealth estimate to treat the total amount in these accounts in the "other short-term claims" category rather than as money market instruments. In the table, these balances are included in line 41.

#### 5. Long-term debt

Foreign investments in long-term debt obligations of private and governmental American entities are, in principle, carried in the Department of Commerce data at market value, as recommended in this report. These investments are included in the attached table in three categories—line 24, corporate, State, and municipal bonds; line 35, long-term marketable U.S. issues; and line 28, other private long-term investments.

(a) *Corporate, State, and municipal bonds.*—The present estimates of foreign holdings of corporate bonds are based on a benchmark study of withholding tax data covering the year 1950, carried forward with data on transactions as reported on the Treasury Department Foreign Exchange Form S-1 (see annex). The data for the benchmark year can be considered relatively complete for those issues the interest on which was subject to tax when paid to foreigners. However, issues on which no interest was paid during that year and all State and municipal issues, the interest on which is not subject to Federal income tax, were, of course, omitted. Moreover, the adjustment of benchmark figures by the use of the S-1 form data over such a long period of time is fraught with possibilities of error, particularly in view of the fact that direct transactions of American residents with foreign brokers are not covered in the data.

<sup>18</sup> Treasury Bulletin, May 1963, p. 90.

<sup>19</sup> Treasury Bulletin, March 1963, p. 88.

The working group strongly recommends that a new benchmark survey, based on the withholding tax records, be made at the earliest possible date. It appears that the use of these records would also be the most feasible method of collecting data on foreign holdings of U.S. corporate bonds in connection with a general national wealth census.

While the Department of Commerce apparently did not classify the benchmark data according to the industry or economic sector of the obligor, such a classification would be possible in any future similar investigations since the data would be available on an issue-by-issue basis.

The absence of any data whatever regarding foreign holdings of State and municipal issues is noted by the working group, and it recommends that steps be taken to remedy this defect in connection with a national wealth census. To the extent that such issues are held in registered form, a survey of the paying agents could be made to determine to what extent interest is paid to foreigners. A survey might also be made of domestic banks, brokers, etc., requesting information on State and municipal long-term securities held in custody accounts for foreign clients. There would remain the problem of coupon issues held directly abroad, the coupons from which are ordinarily presented through commercial banking channels for payment. In such a case, ownership certificates might be required, although some legal, if not constitutional, problems might arise.

(b) *U.S. Government bonds.*—Foreign holdings of marketable U.S. Government issues are estimated on the basis of benchmarks of custody holdings with American financial institutions, recently taken at intervals of 3 to 5 years. These data are kept up to date on the basis of information on transactions reported on Foreign Exchange Form S-1; on this report (see annex), transactions in U.S. bonds and notes are shown separately. Recently, a supplemental report, Foreign Exchange Form S-2, has been inaugurated to secure separately information on transactions in U.S. Government securities by "foreign official institutions," information which is desirable for purposes of balance of payments. In view of the relatively stable market for such securities, at least in the short run, the distinction between maturities of over 1 year and those of less than 1 year is less important than in the case of private securities, especially when the securities are held by official monetary institutions. The total amount held at the end of 1962 was \$2.1 billion (line 35).

Again, it may be noted that the estimates exclude securities held directly abroad by the owners rather than in custody accounts with domestic institutions. However, the data obtained in the periodic benchmark surveys are remarkably consistent with the transactions data obtained from the S-1 form; from this, it seems reasonable to assume that most foreign holdings of these issues are in custody accounts. That the same is not true of foreign holdings of corporate securities is indicated by the fact that a large number of the ownership certificates filed with the Internal Revenue Service in connection with coupons on corporate bonds give evidence that they were, in fact, executed abroad.

(c) *Other long-term debt.*—The only two items in this category for which data are collected on a current basis are long-term liabilities to foreigners of banking institutions, now reported on Foreign Ex-

change Form B-3, and liabilities with an original maturity of more than 1 year reported by nonbanking institutions on Foreign Exchange Form C-1/2. These two items together amounted to \$165 million at the end of 1962 (lines 26 and 27).

Other long-term private debt (line 28) consists of a miscellaneous collection of liabilities to foreigners reported in the Treasury census of foreign assets in the United States, TFR 300, as of 1941. Almost no information has been available that could be used for the purposes of bringing these figures up to date, and it may well be questioned, therefore, whether there is any value in continuing to include them in the estimates. The item includes such things as foreign equities in trusts and estates, the present value of future annuities due to foreigners, miscellaneous debts and claims (most of which, however, would presumably be reportable on Foreign Exchange Forms B-3 or C-1/2), and real estate mortgages.

Obviously, all debt due to foreigners, except nonregistered marketable securities, must be known to the American debtor and, as such, could be reported in any census of foreign liabilities that might be taken, such as the balance sheet survey already discussed. In the absence of such a census, some information could be obtained from the withholding tax returns, since interest paid on private debts is for the most part subject to withholding tax. However, the rate of interest is not usually known; therefore this source would be useful primarily for the purpose of compiling a mailing list for any census of foreign liabilities that might be undertaken.

#### 6. *Direct investments*

The Department of Commerce conducted a census of foreign direct investment in the United States as of 1959.<sup>20</sup> In general, the coverage of this census and the methods of valuation employed were substantially similar to those used in censuses of U.S. direct investments abroad, already described. The data are presented with sufficient industry breakdown to facilitate the sector classifications recommended in this report. The book value of the foreign investment is also broken down between liabilities and net worth; the former separated between long- and short-term and the net worth shown as to common stock, surplus, preferred stock, and net home office accounts of branches. These figures are brought up to date each year by the Department of Commerce on the basis of quarterly and annual surveys of the companies concerned. The adjustments reflect not only capital movements between the American enterprise and its foreign affiliates, but reinvested profits and other adjustments to surplus. The value in 1962 was \$7.6 billion (line 22).

It is evident from what has just been said that the value placed on these investments in the Commerce Department figures is equivalent to book value as that term is ordinarily understood. If, in national wealth estimates, the underlying assets are revalued to a depreciated replacement cost basis, and if the data are available on a company-by-company basis, it would be relatively easy to adjust the estimated book value of foreign direct investments accordingly. Alternatively, if overall ratios are developed between book values and book values thus

<sup>20</sup> U.S. Department of Commerce, "Foreign Business Investments in the United States," a supplement to the "Survey of Current Business," Washington, D.C., 1962.



adjusted, these ratios could be applied to the foreign direct investments in the United States.

It may also be worth noting that the net home office accounts of foreign branches constitute a special kind of liability in that there are no outstanding securities issued by such branches. In any statistical inquiries based on balance sheet data provided with corporate income tax return form 1120, special care should be taken to insure that the balance sheets filed by U.S. branches of foreign corporations reflect only U.S. assets and liabilities of such corporations, and not their total worldwide business.

### *7. Other equities*

Foreign holdings of corporate stocks were estimated for the year 1950 on the basis of an analysis of withholding tax returns. They have been brought up to date using transactions in outstanding corporate stocks between U.S. and foreign residents as reported on Treasury Foreign Exchange Form S-1, and adjusted for changes in market value using the Standard & Poors index of stock prices. Aside from the reservations already expressed with respect to the accuracy of the transactions data, the following weaknesses in the estimates should be mentioned.

(1) Although an allowance was made for foreign holdings of stocks on which no dividends were paid in the benchmark year, by its very nature such an allowance had to be relatively arbitrary. It would have been better to have made a separate inquiry to all non-dividend-paying corporations, at least those whose stocks are publicly held, asking them for information regarding foreign ownership of their shares. However, to have been complete, such an inquiry would also have had to be addressed to all brokers and other dealers holding stocks in "street" names.

(2) Since the transactions data do not provide information regarding transactions in individual issues, it is not possible to make adjustments for changes in market values on an issue-by-issue basis; nor is it possible to adjust foreign holdings on an issue-by-issue basis. Thus, it is not possible to classify current holdings by industry or economic sector.

(3) A (probably minor) source of error results from the holdings of American citizens permanently residing abroad. The holdings of such persons should be included as foreign investments in United States, but dividends thereon are not subject to tax withholding. However, it is understood that the Commerce Department figure includes an arbitrary estimate of \$250 million for such holdings.

Foreign portfolio holdings of corporate stocks, line 23 in the Commerce Department table, amounted to over \$10 billion in 1962, half of total foreign long-term investments in United States. It is obvious that a reasonably accurate estimate of such holdings is essential for any acceptable estimate of the national wealth of the United States. It would also be desirable to have this information in sufficient detail so as to enable calculations to be made both on a market-value and a book-value basis, and by country of ownership.

A reasonably accurate estimate could be obtained at any time merely by repeating the analysis of the withholding tax returns. However, the following additional information would be needed:

(1) Holdings of stock on which no dividends were paid in the census year. The balance sheet survey already mentioned would disclose these, if registered as foreign on the books of the issuing corporation. However, brokers and other nominees would also have to file reports on foreign holdings of such issues.

(2) Holdings of U.S. citizens permanently residing abroad, whose income is not subject to tax withholding. Dividends paid to such persons are reported to the Internal Revenue Service on an information return, form 1099; it may be possible to employ these, if they can be centralized at one point in the Service. The balance sheet survey would also include such holdings; but unless the forms 1099 can be used, it would be necessary to make direct inquiries to brokers and other nominees.

The withholding tax returns, information returns, and direct surveys all would have the advantage of providing data by country of ownership; the balance sheet survey could not feasibly be used to obtain this detail. In summary, the working group recommends that the balance sheet and withholding tax data be relied upon except for *nominee* holdings of (1) non-dividend-paying issues and (2) shares belonging to U.S. citizens residing abroad (unless these, too, can be obtained from forms 1099). Separate reports on these two categories would have to be requested.

#### 8. *Real assets*

Depending on the method used for estimating U.S. residents' holdings of consumer durables, it may be necessary to make an estimate of such assets held by persons living in the United States who would not be considered residents for national wealth purposes. However, the amounts involved must be extremely small and this adjustment could undoubtedly be omitted without any serious detriment to the figures.

Real estate located in the United States but owned by nonresidents, if held primarily as a commercial investment, could well be considered as a "branch" and included in direct investments.<sup>21</sup>

Residential real estate owned by foreigners and held primarily for their own personal use, although it may be available for rental from time to time, has not been included in the estimates of foreign direct investments in the United States prepared by the Department of Commerce nor in any other category in the international investment data. For the sake of completeness, it would appear that such real estate ought to be included in the figures; nevertheless, the amount involved is undoubtedly small, and it may not be worth the trouble of securing data.

The final category of foreign-owned real estate consists of buildings, primarily embassies and embassy residences, but including the U.N. Building and buildings owned by the International Bank and the International Monetary Fund. As far as the working group is aware, no effort has been made to include the value of such buildings

<sup>21</sup> Probably the bulk of foreign-owned commercial real estate is held through domestic corporations and is, therefore, ipso facto included in direct investment.

as a foreign investment in the United States; however, it should not be very difficult to obtain information regarding these assets, together with their approximate current value. The tax records of the District of Columbia could be a source of information, since embassy properties are not subject to property tax in the District and, presumably, some information regarding value is provided when exemption is claimed.

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ANNEX

REPORTING FORMS PRESENTLY IN USE

There follows a list of the foreign exchange forms filed, on a compulsory basis, with the U.S. Treasury Department. In each case, an extensive breakdown by individual countries is obtained. The data are published regularly in the Treasury and Federal Reserve Bulletins. Some of these forms have been inaugurated or revised since December 31, 1962.

*Form B-1—Short-Term Liabilities to Foreigners (monthly)*

- A. Who must report: All banks in the United States, including the branches, agencies, subsidiaries and other affiliates of foreign banks, whose total short-term liabilities to foreigners average \$500,000 or more in a 6-month period. Exemption may be applied to each branch of a reporting institution. Brokers also report if they hold in custody reportable liabilities (e.g., Treasury bills) for the account of foreigners.
- B. Items reported:
1. Short-term liabilities payable in dollars (under separate headings of liabilities to foreign official institutions, to foreign banks, and to all other foreigners):
    - (a) Demand deposits.
    - (b) Time deposits (excluding negotiable time certificates of deposit issued to foreigners).
    - (c) Short-term U.S. Government obligations: Principally Treasury bills and certificates; also includes short-term obligations of corporations and other agencies of the U.S. Government which are guaranteed by the United States.
    - (d) Other short-term dollar liabilities: Including but not limited to the following:
      - (1) Acceptances of domestic banks held in custody for foreign customers.
      - (2) Negotiable time certificates of deposit held in custody for foreigners.
      - (3) Commercial paper.
      - (4) Bills collectible from U.S. residents.
      - (5) Short-term obligations of States and municipalities, and of U.S. Government agencies which are not guaranteed by the United States.
      - (6) Participations granted to foreigners in loans made to domestic customers.
  2. Short-term liabilities payable in foreign currencies (not broken down by type of foreign owner), including but not limited to the following:
    - (a) Deposits held for foreigners.
    - (b) Loans, advances or overdrafts actually granted by foreign banks.
    - (c) Acceptances created for the reporter.

*Form B-2—Short-Term Claims on Foreigners (monthly)*

A. Who must report: Requirement similar to that for form B-1.

B. Items reported:

1. Short-term dollar claims:

- (a) Loans (including overdrafts, and participations in loans of Eximbank and international lending institutions) to—
  - (1) Foreign official institutions.
  - (2) Foreign banks.
  - (3) Other foreigners (business and individuals).
- (b) Collections outstanding for bank's own account and for account of domestic customers.
- (c) Liability to the reporter on acceptances made for account of foreigners (but excluding acceptances made by other banks even if held by reporting bank).
- (d) Other short-term dollar claims, including but not limited to—
  - (1) Dollar demand and time deposits, including negotiable and nonnegotiable time certificates of deposit, held with foreign banks for own and domestic customers' accounts.
  - (2) Commercial paper, finance paper, and promissory and other notes.

2. Short-term foreign currency claims:

- (a) Deposits: Demand deposits and time deposits including negotiable and nonnegotiable time certificates of deposit, held with foreign banks for own and domestic customers' accounts.
- (b) Foreign government obligations and commercial and finance paper.
- (c) Other short-term foreign-currency claims, including but not limited to—
  - (1) Loans outstanding.
  - (2) Collections outstanding.

*Form B-3—Long-Term Liabilities to, and Claims on, Foreigners (monthly)*

A. Who must report: Requirement similar to that for form B-1; exemption applicable separately to long-term liabilities and long-term claims.

B. Items reported:

1. Long-term liabilities (total only; no dollar—foreign currency breakdown or breakdown by type), including but not limited to—

- (a) Participations granted to foreigners in long-term loans made to domestic customers.
- (b) Commercial paper.

Long term securities held in custody are excluded.

2. Long-term claims:

(a) Payable in dollars.

- (1) Loans (including participations in loans of Eximbank and international lending institutions) to—
  - (a) Foreign official institutions.
  - (b) Foreign banks.
  - (c) Other foreigners (businesses and individuals).
- (2) All other long-term dollar claims, excluding long-term securities.

(b) Payable in foreign currencies, including but not limited to loans.

*Form S-1—Purchases and Sales of Long-Term Securities by Foreigners (monthly)*

- A. Who must report: All persons in the United States who engage in transactions in long-term securities with foreigners, if the average of such transactions for a 6-month period is \$100,000 or more. In practice, reports are filed by banks, bankers, securities brokers and dealers, and other business concerns (such as insurance companies, mutual funds, etc.).
- B. Items reported: Purchases by foreigners, and sales by foreigners of the following types of long-term securities:
1. Domestic securities:
    - (a) U.S. Government bonds and notes including securities issued by corporations and other agencies of the U.S. Government which are guaranteed by the United States).
    - (b) Corporate and others (issues of corporations, of States and other political subdivisions in the United States, and of corporations and other agencies of the U.S. Government which are not guaranteed by the United States).
      - (1) Bonds.
      - (2) Stocks.
  2. Foreign securities (securities of foreign central governments and political subdivisions, of corporations or similar organizations chartered in foreign countries, and of international and regional organizations, even if securities are payable in U.S. dollars):
    - (1) Bonds.
    - (2) Stocks.

*Form S-2—Purchases and Sales of U.S. Government Bonds and Notes by Foreign Official Institutions (monthly)*

- A. Who must report: All reporters on form S-1 who engage in transactions in U.S. Government bonds and notes with, or for the account of, foreign official institutions.
- B. Items reported: Purchases and sales of U.S. Government bonds and notes by foreign official institutions.

*Form S-4—Foreign Debit and Credit Balances (semiannual)*

- A. Who must report: All brokers and dealers in the United States who have debit or credit balances for account of, or with, foreigners, of \$100,000 or more on two successive reporting dates.
- B. Items reported:
1. Liabilities:
    - (a) Credit balances in accounts of foreigners with the reporter.
    - (b) Credit balances (as appearing on reporter's books) in accounts of reporter carried by foreigners.
  2. Assets:
    - (a) Debit balances in accounts of foreigners with the reporter.
    - (b) Debit balances (as appearing on reporter's books) in accounts of reporter carried by foreigners.

*Form C-1/2—Liabilities to, and Claims on, Foreigners (quarterly)*

- A. Who must report:** All exporters, importers, industrial and commercial concerns, and other nonbanking institutions in the United States, whose liabilities to, or claims on, foreigners average \$100,000 or more for two succeeding quarters. The exemption is applicable separately to liabilities and to claims.
- B. Items reported:**
1. Liabilities:
    - (a) Short-term, payable in dollars, including but not limited to the following:
      - (1) Accounts, notes, bills, and drafts payable to foreigners.
      - (2) Loans and advances outstanding from foreigners.
      - (3) Advance payments from foreign customers for future shipment of goods.
    - (b) Short-term, payable in foreign currencies:
      - (1) Same types as those payable in dollars.
      - (2) Acceptances made directly for reporter's account by foreigners.
    - (c) Long-term—total only; no dollar-foreign currency breakdown. Same types as short term, where applicable.
  2. Claims:
    - (a) Short-term, payable in dollars, including but not limited to the following:
      - (1) Accounts, notes, bills, and drafts receivable from foreigners.
      - (2) Advance payments to foreigners for future shipments of goods.
      - (3) Dollar deposits held abroad in reporters' own name.
      - (4) Participations in loans of international lending institutions.
      - (5) Acceptance made by the reporter for foreigners.
    - (b) Short-term, payable in foreign currencies:
      - (1) Deposits: Demand and time deposits held abroad in reporter's own name.
      - (2) Other, including but not limited to the following:
        - (a) Accounts, notes, bills, and drafts receivable from foreigners.
        - (b) Bills purchased from others, if drawn on foreigners.
        - (c) Advance payments made in foreign currencies.
        - (d) Investments in short-term foreign government obligations and in other short-term foreign securities.
    - (c) Long-term—total only; no dollar-foreign currency breakdown—including but not limited to the following:
      - (1) Loans and advances.
      - (2) Participations in loans of international lending institutions.
- C. Exclusions:** Form C-1/2 specifically excludes the following:
1. Liabilities and claims held through banks in the United States (presumably reported on forms B-1 and B-2).
  2. Liabilities to, and claims on, reporter's own allied organizations (covered by Commerce Department direct investment reports).
  3. Long-term securities (transactions covered by form S-1).
  4. Unutilized credits.
  5. Contingent liabilities and contingent claims.

*Supplement to Form C-1/2—Short-Term Claims on Foreigners (monthly)*

- A. Who must report: All reporters on form C-1/2 who report on that form total short-term claims on foreigners of \$5 million or more and whose claims reportable on the supplement amount to \$1 million or more as of March 31 or September 30 are required to file on the supplement for each of the following 6 months (April-September; October-March).
- B. Items reported:
1. Short-term claims payable in dollars:
    - (a) Deposits:
      - (1) Demand deposits.
      - (2) Time deposits, including time certificates of deposit.
    - (b) Short-term investments: Holdings of negotiable and other readily transferable commercial and financial instruments payable in dollars. Reporters are required to exclude claims not regarded as short-term investments, such as loans, accounts receivable, and acceptances made by the reporter for account of foreigners.
  2. Short-term claims payable in foreign currencies:
    - (a) Deposits:
      - (1) Demand deposits.
      - (2) Time deposits, including time certificates of deposit.
    - (b) Foreign central government obligations, including obligations issued by instrumentalities of central governments or by local governments, with the guarantee of the central government.
    - (c) Other short-term investments: Holdings as described under short-term dollar investments; includes obligations issued by instrumentalities of central governments, or by local governments, without the guarantee of the central government.
- C. Memorandum columns:
1. Long-term foreign securities within 1 year of maturity, payable in dollars: Holdings of negotiable and other readily transferable foreign government or corporate bonds, notes, debentures, and similar obligations having an original maturity of more than 1 year, which will mature within 1 year of the date of the report.
  2. Long-term foreign securities within 1 year of maturity, payable in foreign countries: Same as above, payable in foreign currencies.
- (1 and 2 are not included in quarterly form C-1/2 but their acquisition is presumably reported on Form S-1)
3. Interest-bearing deposits and investments held through allied organizations, payable in dollars:
    - (a) Items acquired by transfer of funds to foreign subsidiaries or branches for investment abroad at reporter's direction:
      - (1) Time deposits, including time certificates of deposit.
      - (2) Short-term investments, as defined above.
      - (3) Holdings of long-term foreign securities within 1 year of maturity.
    - (b) Proceeds of dividends and other receivables which reporter has directed allied organizations to invest abroad in lieu of payment to reporter.
  4. Interest-bearing deposits and investments held through allied organizations, payable in foreign currencies: Same as above, payable in foreign currencies.
- (Items 3 and 4 are presumably included in direct investment questionnaires of the Commerce Department)

## OBE FORMS

The following forms are used by the Balance-of-Payments Division, Office of Business Economics, U.S. Department of Commerce, to collect data on U.S. direct investments abroad, and foreign direct investments in the United States.

*Survey of American business investments abroad, 1957*

All persons, corporations, or other economic units with "direct" investments abroad (more than a 10-percent interest in a foreign enterprise) were required to report, except that individuals with reportable assets valued at less than \$25,000 were exempt. The basic form, BE-10B, was required for each foreign en-

terprise in which the reporter held an interest of 25 percent or more; a somewhat simpler form, BE-10C, was required for foreign enterprises in which the reporter held from 10 to 25 percent of the voting stock.

For national wealth purposes, only sections 6, 9, 14, and 15 are of interest, and these are reproduced below. As indicated in the text, this survey provided data on the U.S. equity in the foreign organization, at book value as reflected on the books of the latter. Only a very general description of the real assets was requested; there would be no possibility of using these data to adjust the value of the underlying assets to a depreciated replacement cost basis.

6. If the answer to question 5 is "foreign corporation," give information regarding ownership of the securities of the allied foreign organizations.

Ownership	Percent of voting stock owned	Nonvoting stock, bonds, debentures, and other long-term debt	
		Percent owned	Amount in currency in which payable
a. U.S. reporter.....			
b. U.S. affiliates: Names: .....			
c. Foreign affiliates: Names: .....			
d. Nonaffiliated U.S. interests.....			
e. Nonaffiliated foreign interests.....			
f. Total amount outstanding.....	100	100	

9. Balance sheets: Submit data of the allied foreign organization as of Dec. 31, 1957, and Dec. 31, 1956, or as of the close of the organization's fiscal years ending nearest these dates. Specify the dates of the reports. (Data reported in items 9 through 16 must all be as of the same dates or period covered.)

Item	Dec. 31, 1957 (or date)		Dec. 31, 1956 (or date)	
	In currency used on books of allied foreign organization (specify)	Converted to currency of parent organization (specify)	In currency used on books of allied foreign organization (specify)	Converted to currency of parent organization (specify)
<b>ASSETS</b>				
a. Total current assets.....				
b. Investments in and advances to branches, subsidiaries, and affiliates.....				
c. Fixed assets, at cost.....				
d. Less related reserves.....				
e. Other assets.....				
f. Total assets (items a-e).....				
<b>LIABILITIES</b>				
g. Current liabilities.....				
h. Long-term debt.....				
i. Other liabilities and liability reserves.....				
j. Total liabilities (items g-i).....				
<b>NET WORTH</b>				
k. Capital stock.....				
l. Surplus (or deficit).....				
m. Surplus reserves (specify).....				
n. Other <sup>1</sup> .....				
o. Total net worth (items k-n).....				

<sup>1</sup> Show in this item home office account of branches, net proprietorship account, or partnership account.



## 14. Investment of parent organization in the allied foreign organization:

Item	End of year (or date)				Beginning of year (or date)			
	Percent owned	As carried on books of and in currency of parent organization (specify)	As carried on the books of the allied foreign organization		Percent owned	As carried on books of and in currency of parent organization (specify)	As carried on the books of the allied foreign organization	
			In currency regularly used on such books (specify)	Converted to currency of parent organization (specify)			In currency regularly used on such books (specify)	Converted to currency of parent organization (specify)
a. Current liabilities owed to parent .....								
b. Long-term debt owned to parent .....								
c. Common stock owned by parent .....								
d. Preferred stock owned by parent .....								
e. Parent's equity in surplus (deficit) .....								
1. Capital surplus .....								
2. Earned surplus (deficit) .....								
f. Parent's equity in surplus and other reserves (specify): .....								
g. Other (specify): <sup>1</sup> .....								
h: Total (items a-g) .....								

<sup>1</sup> Show home office account of branches, net proprietorship account, or partnership account.

15. Investment of allied foreign organization in parent company :

Item	End of year (or date)				Beginning of year (or date)			
	Percent owned	As carried on books of and in currency of parent organization (specify)	As carried on the books of the allied foreign organization		Percent owned	As carried on books of and in currency of parent organization (specify)	As carried on the books of the allied foreign organization	
			In currency regularly used on such books (specify)	Converted to currency of parent organization (specify)			In currency regularly used on such books (specify)	Converted to currency of parent organization (specify)
a. Stock.....	-----	-----	-----	-----	-----	-----	-----	-----
b. Long-term debt.....	-----	-----	-----	-----	-----	-----	-----	-----
c. Intercompany accounts, notes, and advances.....	-----	-----	-----	-----	-----	-----	-----	-----
d. Other (specify).....	-----	-----	-----	-----	-----	-----	-----	-----
e. Total (Items a-d).....	-----	-----	-----	-----	-----	-----	-----	-----

*Survey of foreign business investments in the United States, 1959*

The form used in this survey, BE-145, was substantially similar to form BE-10B, and is not reproduced here. All branches of foreign enterprises were covered, and all domestic corporations, etc., in which a foreigner, or related group of foreigners, held 25 percent or more of the beneficial ownership.

*Current reports*

Estimates of the value of U.S. direct investments abroad and foreign direct investments in the United States are extrapolated from the benchmark provided by the two surveys just mentioned, using data collected on quarterly report. These reports, mandatory since 1962, cover about 90 percent of the investments involved (on a value basis—about 30 percent of the companies by number). There are several forms, to suit various special situations. However, forms BE-577 and BE-578 are representative of the group and are reproduced below. These forms provide data on capital movements and reinvested earnings, and hence provide a quite reliable estimate for extrapolating the value of the investment.

<p><b>FORM BE-577</b> (1-17-64)</p> <p style="text-align: center;"><b>U.S. DEPARTMENT OF COMMERCE OFFICE OF BUSINESS ECONOMICS</b></p> <p style="text-align: center;"><b>'CONFIDENTIAL QUARTERLY REPORT TRANSACTIONS WITH FOREIGN SUBSIDIARY OR AFFILIATED CORPORATION</b></p> <p><b>Please see Instructions on Reverse Side before Completing Form</b></p> <p><b>TO: Office of Business Economics, U.S. Department of Commerce Washington, D.C. 20230, Routing No. BE-50</b></p>	<p>Quarter ended _____</p> <p>Name of U.S. reporter _____</p> <p>Name of foreign company _____</p> <p>Country of foreign company operations _____</p>
Items received or entered into intercompany accounts	
1. Dividends	Amounts (In dollars) after withholding taxes
(a) On common stock (Tax withheld \$ _____)	
(b) On preferred stock _____	
2. Interest on bonds, notes, advances, etc.	
3. Royalties, license fees, and rentals	
4. Reporting company's charges for services rendered, including management, allocated expenses, etc.	
5. Reporter's equity in foreign company's annual net income (or loss) for the year ended..... _____	Enter only once a year (See Instructions)
	Amount in foreign currency      Amount in U.S. dollars
6. Reporter's equity in the foreign company's earned surplus account at the end of .....	
<b>7. Current or short-term intercompany accounts, notes, and advances outstanding (Original maturity one year or less)</b>	
	Currency Unit (See Instructions)
	Show this item in the currency in which it is payable
	Due to U.S. Reporter      Payable by U.S. Reporter
a. Beginning of Quarter	
b. End of Quarter	
c. Do Not Fill In Net Change	
<b>8. Bonds, notes and long-term advances outstanding (Original maturity over one year)</b>	
	Currency Unit (See Instructions)
	Show this item in the currency in which it is payable
	Due to U.S. Reporter      Payable by U.S. Reporter
a. Beginning of Quarter	
b. End of Quarter	
c. Do Not Fill In Net Change	
<b>9. Change in U.S. Reporter's holdings of capital stock of, and/or capital contributions to, foreign subsidiary or affiliate</b>	
a. <input type="checkbox"/> Increase <input type="checkbox"/> Decrease	b. Type of security
	c. Amount of transactions
	d. Means of settlement
	e. Percent of issue owned before transactions _____ % after transactions _____ %
<b>f. Other parties to transactions (Check one)</b>	
<input type="checkbox"/> Foreign <input type="checkbox"/> U.S. (Give name and address if U.S.)	
<b>g. If a newly-acquired foreign enterprise, indicate type of business and principal product or service.</b>	

## GENERAL INSTRUCTIONS

**Purpose** - Reports on this form are required in order to provide reliable and up-to-date information on the foreign investment operations of U.S. business affecting the U.S. balance of international payments. Related information is collected on Forms BE-578 (foreign unincorporated branches), BE-35 (foreign subsidiaries and branches of U.S. motion picture companies), BE-578B (foreign unincorporated branches of U.S. banking firms), BE-578-I (foreign subsidiaries and branches of U.S. insurance companies), BE-577A (foreign associated companies), and BE-577S (secondary foreign corporations). (See definitions below).

The following is a condensation of the applicable set of instructions and regulations; a complete set will be sent on request.

**Authority** - Reports on Forms BE-577, BE-578, BE-35, BE-578B, BE-578-I, BE-577A, and BE-577S are mandatory under Section 8(b) of the Bretton Woods Agreements Act (59 Stat. 315, 22 U.S.C. 286f). The report has been approved by the Bureau of the Budget under the Federal Reports Act (Public Law No. 831, 77th Congress). All replies will be held in confidence under the provisions of Section 4(b) of that Act and Section 8(c) of the Bretton Woods Agreements Act.

**Who Must Report** - Separate reports on Form BE-577 are required from U.S. corporations and other U.S. residents for transactions with each foreign subsidiary or affiliated corporation in which they own 25 percent or more of the voting stock, either directly or together with other U.S. or foreign affiliates. In the case of joint ownership, one owner may file a combined report. Reports are also required for direct transactions with secondary foreign corporations (see definitions below), or with companies owned by affiliated U.S. owners.

**Filing of Report** - Form BE-577 is a quarterly report. A single copy of each report should be sent to the Department of Commerce, Office of Business Economics, Balance of Payments Division, Washington, D.C. 20230, within 30 days after the close of each calendar or fiscal quarter, except for the final quarter of the calendar or fiscal year when reports may be filed within 45 days. Requests for extension of the filing dates, additional forms, or clarifications of the reporting requirements or instructions should be directed to the same address.

**Exemption** - A U.S. resident otherwise required to report is exempted from filing a report if the aggregate value of his investment, and that of his domestic subsidiaries or affiliates, in foreign branches, subsidiaries, affiliated or associated corporations, including applicable proportion of surplus accounts and debt, is less than \$2,000,000, at the beginning of the calendar year, based on the books of the foreign enterprises. Reports for foreign subsidiaries or affiliates which are inactive, or have a book value, including surplus accounts and intercompany indebtedness, of less than \$25,000 may be omitted with a note to that effect.

**Consolidations** - Consolidated reports may be filed covering more than one subsidiary or affiliate in the same country and industry (foreign branch operations should be reported on Form BE-578, investments in associated foreign companies on Form BE-577A, and reports for secondary foreign affiliates on Form BE-577S unless already consolidated in Form BE-577).

## DEFINITIONS

**U.S. Resident** - Any person (including corporations, trusts, estates) under the jurisdiction of the United States ordinarily residing in the United States, including its territories or possessions.

**Foreign Subsidiary or Affiliated Company** - For purposes of these reports, any foreign incorporated company in which a U.S. owner, or affiliated group of owners, holds 25 percent or more of the voting stock, directly or indirectly, as provided below.

**Associated Foreign Company** - A foreign-incorporated company in which a U.S. owner, or affiliated group of owners, directly holds at least 10 percent but less than 25 percent of the voting stock (see Form BE-577A).

**Primary Foreign Corporation** - A foreign subsidiary or affiliated company in which 25 percent or more of the voting stock is owned by U.S. residents, either directly or together with domestic or foreign affiliates.

**Secondary Foreign Corporation** - A foreign subsidiary or affiliated company in which a U.S. ownership of 25 percent or more of the voting stock is held through ownership of at least 50 percent of the voting stock in a primary foreign corporation which in turn owns at least 50 percent of the voting stock of the secondary foreign corporation (see Form BE-577S).

**Foreign Branch** - An unincorporated foreign business operation conducted by a U.S. resident or group of persons (corporate or otherwise) in a foreign country (see Form BE-578).

## SPECIFIC INSTRUCTIONS

**Items 1-4** - Enter only amounts actually received or entered into the intercompany accounts during the reporting period. Stock dividends should be reported in item 9 (see below).

**Item 3** - Report all royalties and fees including patent royalties, production royalties, copyright royalties, etc., as well as license fees and rentals received, or entered into intercompany accounts, during the reporting period.

**Item 4** - Report all receipts or allocated charges of reporter for professional, administrative or management services.

**Item 5** - This item is to be filled in once each year on the report for the quarter during which the relevant figures become available. The amount entered for this item should be shown in the currency in which the books of the foreign company are kept, and in U.S. dollars if such conversions are ordinarily made, and should represent your portion of the foreign company's net income (or loss) for the year, before provision for (a) unrealized exchange losses and gains; (b) common dividends; but after provision for foreign income taxes and the payment of preferred dividends. Companies whose foreign enterprises are engaged in extractive industries should report net income before depletion charges, except charges representing the amortization of the actual cost of capital assets. If a report is filed which covers transactions with both primary and secondary foreign subsidiaries, the net income given should consolidate the income of secondary companies.

**Item 6** - Report your equity in the foreign company's earned surplus account as of the end of the year shown in Item 5. The amount entered in this item should be shown in the currency in which the books of the foreign company are kept.

**Items 7-8** - If the currency unit used in accounts reported in Items 7 and 8 is other than U.S. dollars, please specify. Report in these items all accounts between the U.S. parent or its domestic affiliates and the foreign organization regardless of the currency in which these accounts are payable, including accounts which may be blocked or are not regularly carried on the reporter's books. Entries made in Items 7 and 8 should be consistent with entries made in Items 1-4 insofar as they reflect these items. When there is nothing to report, please state "None" or "0".

**Item 9** - Enter here any changes in the reporter's and/or its domestic affiliates' holdings of capital stock of the foreign subsidiary or affiliated company including preferred stock, and common or ordinary stock. Stock dividends, capital contributions by the parent company, and capitalization of intercompany accounts should also be included but should be identified separately. If a company is wholly liquidated or sold to foreign interests, show the amount obtained in liquidation, or sales price. Report also the amount of profit or loss on the liquidation or sale of the enterprise based on the book value of the reporter's equity as shown on the foreign company's books.

FORM BE-578 (1-17-64)	U.S. DEPARTMENT OF COMMERCE OFFICE OF BUSINESS ECONOMICS	Quarter ended  Name of U.S. reporter  Country of foreign operations  If this is a first report, indicate the type of business and principal product or service.
<b>CONFIDENTIAL QUARTERLY REPORT                  OPERATIONS OF FOREIGN BRANCHES OR                  OTHER UNINCORPORATED FOREIGN BUSINESS                  OF U.S. REPORTERS</b>		
Please see Instructions on Reverse Side before Completing Form		
TO: Office of Business Economics, U.S. Department of Commerce, Washington, D. C. 20230, Routing No. BE-50		
Item No.	Changes in investment (See Specific Instructions)	Amounts (In dollars)
1	Net investment in foreign country at book value at beginning of quarter	
2	Home office chargés for cash remitted or merchandise, machinery, etc., shipped to branch	
3	Royalties, license fees, and rentals charged by home office to branch	
4	Home office charges for management, services, U.S. expenses allocated, etc.	
5	Interest charged by home office to branch	
6	Net income (or loss) of foreign branch or properties (Period )	
7	Other additions (Please specify)	
8	<b>TOTAL ADDITIONS (Items 2 thru 7)</b>	
9	Cash remittances of income to home office	
10	All other cash remittances to home office	
11	Shipments of merchandise, etc., to or for account of the home office	
12	Other deductions (Please specify)	
13	<b>TOTAL DEDUCTIONS (Items 9 thru 12)</b>	
14	Unrealized profit or loss resulting from exchange revaluations	
15	Net investment in foreign country at book value at end of quarter (Item 1 + Item 8 - Item 13 + Item 14)	
16	<b>DO NOT FILL IN</b> Net changes	
Please note in this space any comments or qualifications which you feel might be helpful		

## GENERAL INSTRUCTIONS

**Purpose** - Reports on this form are required in order to provide reliable and up-to-date information on the foreign investment operations of U.S. business affecting the U.S. balance of international payments. Related information is collected on Forms BE-577, (foreign-incorporated enterprises owned by U.S. owners to the extent of at least 25 percent of voting stock), BE-578 (foreign subsidiaries and branches of U.S. motion picture companies), BE-578B (foreign unincorporated branches of U.S. banking firms), BE-578I (foreign subsidiaries and branches of U.S. insurance companies), BE-577A (foreign associated companies), and BE-577S (secondary foreign corporations). (See definitions below.)

The following is a condensation of the applicable set of instructions and regulations; a complete set will be sent on request.

**Authority** - Reports on Forms BE-577, BE-578, BE-35, BE-578B, BE-578I, BE-577A and BE-577S are mandatory under Section 8(b) of the Bretton Woods Agreements Act (59 Stat. 515, 22 U.S.C. 286f). The report has been approved by the Bureau of the Budget under the Federal Reports Act (Public Law No. 831, 77th Congress). All replies will be held in confidence under the provisions of Section 4(b) of that Act and Section 8(c) of the Bretton Woods Agreements Act.

**Who Must Report** - Separate reports on Form BE-578 are required from U.S. corporations and other U.S. residents for each unincorporated foreign branch or business office and other property or direct foreign operations of U.S. reporters, including the development and operations of foreign mining claims, oil concessions held directly or jointly with others, and other property such as real estate, as reflected on the books of the head office in the U.S. Separate reports should be filed for each foreign branch; however a combined report may be filed where the reporter or persons affiliated with him have several foreign branches in the same country and industry. In the case of joint ownership or interests, one owner may file a combined report. Royalties, service fees and interest received from foreign branches by domestic companies affiliated with the reporter should be included in this report. (Foreign subsidiaries or affiliated corporations should be reported on Form BE-577).

**Filing of Report** - Form BE-578 is a quarterly report. A single copy of each report should be sent to the Department of Commerce, Office of Business Economics, Balance of Payments Division, Washington, D.C. 20230 within 30 days after the close of each calendar or fiscal quarter, except for the final quarter of the calendar or fiscal year when reports may be filed within 45 days. Requests for extension of the filing dates, additional forms, or clarifications of the reporting requirements or instructions should be directed to the same address.

**Exemption** - A U.S. resident otherwise required to report is exempted from filing a report if the aggregate value of his investment and that of his domestic affiliates in foreign branches, subsidiaries, affiliated or associated corporations, including applicable proportion of surplus accounts and debt, is less than \$2,000,000, at the beginning of the calendar year, based on the books of the foreign enterprises. Reports for foreign subsidiaries or branches which are inactive or have a book value, including surplus accounts and inter-company indebtedness, of less than \$25,000 may be omitted with a note to that effect.

**Consolidations** - Consolidated reports may be filed covering more than one branch in the same country and industry (foreign-incorporated enterprises should be reported on Form BE-577 and 577S; investments in associated foreign companies on Form BE-577A.)

## DEFINITIONS

**U.S. Resident** - Any person (including corporations, trusts, estates) under the jurisdiction of the United States, ordinarily residing in the United States including its territories or possessions.

**Foreign Subsidiary or Affiliated Company** - For purposes of these reports, any foreign-incorporated company in which a U.S. owner, or affiliated group of owners, holds 25 percent or more of the voting stock, directly or indirectly.

**Associated Foreign Company** - A foreign incorporated company in which a U.S. owner, or affiliated group of owners, directly hold at least 10 percent but less than 25 percent of the voting stock.

**Primary Foreign Corporation** - A foreign subsidiary or affiliated company in which 25 percent or more of the voting stock is owned by U.S. residents, either directly or together with domestic or foreign affiliates (see Form BE-577).

**Secondary Foreign Corporation** - A foreign subsidiary or affiliated company in which a U.S. ownership of 25 percent or more of the voting stock is held through ownership of at least 50 percent of the voting stock in a primary foreign corporation which in turn owns at least 50 percent of the voting stock of the secondary foreign corporation (see Form BE-577S).

**Foreign Branch** - An unincorporated foreign business operation conducted by a U.S. resident or group of persons (corporate or otherwise) in a foreign country.

## SPECIFIC INSTRUCTIONS

**Items 1 and 15** - Net investment in foreign countries should comprise all assets of the branch located abroad, including those carried only on the home office books, less foreign liabilities.

**Item 3** - Report all royalties and fees including patent royalties, production royalties, and copyright royalties as well as license fees and rentals received or credited to the home office during the reporting period.

**Item 4** - Report all receipts or allocated charges of reporter for professional, administrative, or management services. Do not include United States income taxes.

**Item 6** - Report the net income (or loss) of foreign properties, when taken up on the books of the home office, before provisions for U.S. income taxes and unrealized exchange losses and gains, but after deduction for other expenses incurred in the United States by or on behalf of the foreign branch. (It is assumed that such other expenses would be reflected in Items 2 through 5.) Companies whose foreign branches are engaged in extractive industries should report net income before depletion charges, except charges representing the amortization of the actual cost of capital assets.

**Item 10** - If remittances are not segregated as to purpose, report all cash remittances in this item.

**Item 14** - Report here the amount for unrealized profit or loss resulting from exchange revaluations. Exclude this amount from item 6, net income (or loss) of foreign branch.

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APPENDIX II: PART E  
REPORT OF THE WORKING GROUP ON AGRICULTURAL  
WEALTH

Prepared by PHILIP T. ALLEN

MEMBERSHIP LIST OF THE AGRICULTURAL WEALTH WORKING GROUP

Philip T. Allen (secretary), Economic Research Service, Department of Agriculture.

Jay Atkinson, Office of Business Economics, Department of Commerce.

J. H. Atkinson, Department of Agricultural Economics, Purdue University.

Raymond Hurley, Agriculture Division, Bureau of the Census.

Robert Masucci, Economic Research Service, Department of Agriculture.

Mardy Myers, Economic Research Service, Department of Agriculture.

William Scofield, Economic Research Service, Department of Agriculture.

Zvi Griliches, Department of Economics, University of Chicago.

Alvin S. Tostlebe, Department of Economics, College of Wooster.



## PREFACE

The Working Group on Agricultural Wealth met on three occasions: May 20, July 10, and September 20, 1963. Mr. Griliches did not participate in the final stages of this report. Committee members other than Mr. Griliches participated in the discussions and reviewed a preliminary draft of this report; however, final responsibility for the report rests with the secretary.

A number of other persons attended meetings of the working group and made helpful suggestions including David J. Hyams, John W. Kendrick, and Neal Potter.

The report is, of course, the responsibility of the secretary. I have attempted to reflect the consensus of the group, although no member should be held responsible for all the views and recommendations contained in the report. Individual members of the working group were free to write supplementary statements, clarifying their individual views or dissenting from recommendations, but none chose to do so.

PHILIP T. ALLEN.

## AGRICULTURE

### I. USES ANTICIPATED FOR IMPROVED ESTIMATES OF AGRICULTURAL WEALTH<sup>1</sup>

If existing estimates of agricultural wealth are strengthened and broadened as recommended in this report, we believe the data would be valuable in many ways. In the first place, the objectives of the overall study would be served—the wealth of the agricultural sector is, of course, a significant part of the Nation's total wealth. For this reason, reasonably accurate data on agricultural wealth on a basis comparable with that of the other sectors are essential.

But uses much beyond this minimum are possible, and in our opinion are a reasonable goal, well worth the additional cost. The improved wealth estimates would make possible the calculation of many economic magnitudes—such as capital invested per worker or per farm, returns to capital, and capital-output comparisons. With the figures available over time, by regions, and classes of farms, their potential value is great. In fact, a number of such calculations are made and used now even though the underlying data and concepts need to be strengthened.

An important part of the benefits of the wealth study would be the greater range of comparisons that would be made possible between the farm and the nonfarm sectors. Heretofore such comparisons have been of somewhat limited usefulness mainly because of the greatly different methods of valuing capital—agricultural values are largely on a market-value basis, while nonagricultural valuations are to a considerable extent on an original cost-less-depreciation basis.

We have suggested the use of surveys and other methods of obtaining needed improvements in the data that underlie some of the estimates of agricultural wealth. In addition to improvements in the data, we have recommended that greater detail be shown in the presentation of various statistics, particularly those on farm income, to permit different users of the data to make such combinations as desired for various purposes. Greater detail, and alternative presentations are also suggested for the "Balance Sheet of Agriculture."

These uses we visualize for agricultural wealth data are reflected in our recommendations appearing later in this report. In addition, our recommendations are influenced by the special characteristics of agriculture, and by the condition of the pertinent agricultural data. In agriculture, production and consumption aspects of living are intertwined to a much greater extent than in any other sector. Several of our recommendations relate to separating these two aspects. We have gone further along this line than has generally been done in the past partly because of the needs of comparability with other sectors of the wealth study and partly because, with the increasing com-

<sup>1</sup> The working group on agricultural wealth was the first of the 14 working groups to be organized as part of the Wealth Inventory Planning Study.

mercialization of agriculture, this division seems less artificial than it once did. However, we are insisting that separate figures be shown on the consumption or farm household aspects, so that data of this nature can be recombined with the production figures if desired.

The agriculture sector also is characterized by its rental of a sizable portion of the assets it uses. Thus our recommendations include means for separating ownership and use, both within the agricultural sector and outside. In a related way better information is especially needed on the expanding agricultural services industry, and on the wealth this sector provides to the farm sector.

Because of the increasing importance of borrowed funds in agriculture, even though in the aggregate the agricultural sector is still not heavily indebted at this time, it is desirable to have information on financial claims and also financial assets of the sector, that can be related to the estimates of the physical wealth of the agricultural sector, and to the income of the sector. The debt/asset and debt/income relationships in agriculture could also be compared, on a more adequate basis than is now possible, with debts, assets, and incomes in other sectors of the economy.

## II. SUMMARY REVIEW OF AVAILABLE DATA RELATING TO AGRICULTURAL WEALTH

The principal physical asset in agriculture is farm real estate. As reported in the "Balance Sheet of Agriculture 1963"<sup>2</sup> the estimated market value of farmland including the residences of operators and hired hands as well as service buildings and other structures, on March 1, 1963, was \$144 billion. Other physical assets, defined in the balance sheet to include goods used for farm family living as well as goods used in farm production, were valued at \$55 billion. Within this group machinery and motor vehicles were largest in value, about \$19 billion, and livestock next largest—about \$17 billion. Nonphysical assets—mostly demand deposits, savings bonds, and investments in cooperatives—made up the remaining \$18 billion of the total value of assets of \$217 billion. Debts owed against these assets by the farm operator and landlord owners totaled \$30 billion.

Methods of valuing farm real estate and some of the problems that need solution for wealth study purposes are discussed in detail in a later section of this report.<sup>3</sup> The basic data are from the periodic censuses of agriculture in which farm operators answer the question "about how much would the land and buildings (on this farm) sell for?" Values based on these answers have been given a variety of checks over the years by the Department of Agriculture and it has been found that the values approximate market values. The valuation of buildings as distinct from farmland presents some problems which are reviewed in this report. In general the underlying data on farm real estate are considered as strong. Adequate State estimates are

<sup>2</sup> Garlock, F. L., and others under the direction of Norman J. Wall, 1947-63. "The Balance Sheet of Agriculture," 1947 to date. Washington, D.C. USDA, Economic Research Service.

<sup>3</sup> For a detailed description of farm real estate statistics see U.S. Department of Agriculture:

1957: Major Statistical Series of the U.S. Department of Agriculture. How they are constructed and used. Vol. 6: Land Values and Farm Finance, Agricultural Handbook 118.

Other volumes in the handbook series may be of interest especially: Vol. 3: Gross and Net Farm Income. Vol. 8: Crop and Livestock Estimates.

available. The problems with which the agricultural working group was mainly concerned related to such matters as completeness of coverage, comparability with definitions in the overall wealth inventory planning study, and problems of data conversion to constant dollars.

The crop and livestock data needed for the wealth estimates are also strong and are available in considerable detail. A few small gaps in the data can be filled without difficulty.

Probably greatest attention will need to be given to measures of the value of farm machinery and equipment on farms, and to the value of liquid assets owned by farm operators. U.S. Department of Agriculture estimates of the value of farm machinery are based on an outdated benchmark, and on data of uncertain quality since the benchmark year. There is little direct relationship possible between estimated values and numbers of machines as reported in various censuses of agriculture. Moreover, State data on values are unavailable. Finally the determination of the present value of farm machinery and equipment has become increasingly complex because of the establishment of revised depreciation rules by Internal Revenue Service. This report considers means of achieving the desired improvement in the machinery and equipment data.

The USDA estimates of financial assets owned by farmers are also probably not very accurate. These estimates are based largely on indirect measures—such as basing estimates of saving bonds purchases by farmers on the saving bonds purchases of all persons in a particular region. It is not known to what extent these indirect measures are applicable. Sample surveys and other means are suggested in this report to improve these financial wealth estimates.

Information on the rapidly growing "agricultural services" industry is scarce and constitutes a major weakness in measuring the total wealth used in the production of farm products.

### III. SUMMARY OF RECOMMENDATIONS

Our recommendations follow the traditional breakdowns and in this order—land and buildings, crops, machinery, livestock, and financial assets and claims. Our focus is on "census farms" as defined in the 1959 census with account being taken of underenumeration, of certain agricultural lands not included in farms, and of the few soil bank farms. While the agricultural services are to be covered by the services sector working group, we indicate in this report the need for new information in this area and the kinds of data we believe are needed.

We make three general types of recommendations:

1. Redefining concepts and providing for more detailed presentations of data to improve comparabilities within the agricultural sector, and between the agricultural sector and other sectors.

2. In the data collection category—recommendations for new data, more accurate data, or more detailed data.

3. Recommendations for the development of new measures of various items using existing data or data collected in 2 above.

The major recommendations, summarized here, are described in detail in later sections of this report.

1. Recommendations for redefining concepts and more detailed presentations:

(1) Land and buildings—to improve comparability with other sectors, the value of all residences on census farms should be transferred from the agricultural sector to the household sector.

(2) To permit more adequate comparisons with the wealth estimates we suggest that greater detail be shown in the “off farm” component of the income of farm operators. Sufficient detail is needed so that farm operators’ total income can be grouped into three classes, as follow:

1. Income from the sale of farm and forestry products produced on census farms.

2. Income from secondary sources associated with the same land and equipment that is used to produce farm products. Examples of such income are imputed rents of farm residences, mineral leases, royalties, and certain recreational income.

3. Personal income of the farm operator from wages, salaries, nonfarm investments, etc.

With income and expenditure items relating to the “imputed rental value of the farm residence” available in detail in the farm income accounts, comparisons of the appropriate income figures with estimates of farm wealth less the value of farm residences would thus be possible.

(3) To improve the comparability of concepts in the “balance sheet of agriculture” with concepts in farm income, crops under Commodity Credit Corporation loan should be excluded from balance sheet assets, and the loans excluded from the liabilities.

(4) The value of household furnishings and equipment (like the value of the farm homes), now shown as a balance sheet asset, should be transferred out of the agricultural sector. The physical assets remaining in the balance sheet would then be owned or rented assets that are used exclusively for the production of farm products, or used jointly for the production of farm products and of products that yield “secondary” income to the agricultural sector.

(5) Financial assets and claims associated with the farm household would be transferred out of the agricultural sector.

(6) The most important lessors of agricultural wealth are two types of landlords—either landlords who themselves operate farms in addition to farms they lease to others, or nonoperating landlords. We recommend that the wealth of farm-operator landlords be considered as entirely owned in the agricultural sector, and that the agricultural wealth of nonoperating owners be considered as owned by the real estate industry. Some of these nonoperating owners are governments and institutions. The wealth of all of these nonoperating owners would be considered as leased by farm operators from outside the agricultural sector.

(7) In all of the shifts listed above it is essential that separate detail be available for the items shifted so that regroupings or recombinations of the data may be made in any way desired.

(8) Classifications recommended for the presentation of the wealth data:

1. That the goal be to present the major part of the wealth data on a State basis, except in the few States where agriculture is a nominal industry, and regional groupings would suffice.<sup>4</sup>

2. That wherever feasible the State data be shown for four economic classes of farms as defined in the 1959 Census of Agriculture:<sup>5</sup>

(1) large commercial farms—1959 gross value of sales of farm products of \$20,000 or more.

(2) medium size commercial farms—commercial farms with value of sales of \$5,000 to \$19,999.

(3) small commercial farms—commercial farms with value of sales of less than \$5,000.

(4) noncommercial farms.

2. Data collection recommendations:

(1) Land and buildings:

1. Collection of value-per-acre data for specified classes of land to be used in the calculation of constant dollar values for farm real estate. As a minimum, separate valuations would be needed for irrigated cropland, nonirrigated cropland, and pasture.<sup>6</sup>

2. A special benchmark survey to provide a basis for allocation of values between farmland and buildings, and between farm residences and other buildings.

3. It is believed that the bulk of the information needed to determine the value of farmland that is rented, and the classification by sector of ownership, can be obtained from the census of agriculture. (As indicated later, perhaps one or two additional questions would be needed in the 1969 Census of Agriculture.)

(2) Farm machinery and equipment:

1. Collection of data showing numbers of farm machines, by appropriate classes and characteristics, to improve present value estimates and to permit State estimates. As indicated later, a pilot survey may be made to help determine whether farm machinery values can be estimated with reasonable accuracy by respondents.

2. As part of the above survey, information on the ownership of machinery can be obtained.

3. An important use of this survey data will be to assist in evaluating present USDA procedures for estimating de-

<sup>4</sup>The working group on agricultural wealth did not specifically consider the potential value of wealth data for areas smaller than States. It has been suggested that one of the main uses of the wealth data might be in area development for which tabulations would be needed by groups of counties or other local governmental units. However, the cost of obtaining data at the county level may limit the number of items available at that level.

<sup>5</sup>The decision regarding the exact class interval limits can be postponed until after the 1964 census. Continued increases in the average size of commercial farm suggest that by 1969 the upper open-end classification may be \$40,000 or more gross sales. Also, there is interest in the large number of farms of very small size. Thus more than the minimum number of classes suggested above may be desired, and, in view of continued improvements in data processing, such tabulations probably would not be excessively costly.

<sup>6</sup>Mr. Hurley comments: "Increasingly tracts of land have value because of their effect on the scale of operations of the purchasers. Land is not sold by classes and there is no way of obtaining values by classes that mean anything."

preciation and the related values of the stock of machinery and equipment on farms.

(3) Livestock:

1. We believe adequate information on ownership of livestock could be obtained from a small survey of livestock ownership under various leasing arrangements. These data could then be expanded on the basis of the information obtained in the census on lease arrangements.

(4) Financial assets and claims:

1. Collection of data showing, by principal categories, holdings of financial assets of various types, by such regional grouping of States as are appropriate for the overall wealth estimates. State estimates of these items are considered to be unduly costly.

2. An effort will be made to allocate, on the basis of a small survey, financial assets and debts between farm business sector holdings and household holdings.

(5) Agricultural services:

1. We recommend that a detailed study be made of the standard industrial classification grouping of the agricultural services with a view toward developing a new grouping that would be more suitable than the present one for agricultural wealth measures.

2. That each of the agricultural services be covered by a census-type survey.

3. That sample farm survey data be developed on expenditures by farmers for agricultural services to supplement the data obtained in a survey of the services.

(6) Possible farm balance sheet, income and expenditure, and land ownership and use survey.

Because of the need to collect so considerable an amount and variety of wealth, income, and expenditure data as indicated in this report, we recommend that consideration be given to an alternative procedure of collecting all of the needed information (and perhaps data needed for other uses as well) in one broad survey of farm income and expenditures, of assets and debts, and of land ownership and use.

3. Development of new measures:

(1) Land:

1. To assist in developing a constant dollar measure of land values, a research project is recommended to investigate the value of private and public improvements to farmland such as drainage, land clearing, various soil conservation measures, and similar items.<sup>7</sup> Present depreciation and investment accounts for farm buildings also need further study and refinement.

(2) Crops:

1. A technique for valuing growing crops as a "goods in process" component of agricultural wealth is outlined in the report for crops.

<sup>7</sup> Mr. Hurley disagrees with this recommendation.

## (3) Livestock:

1. Inventory values of "broilers"—for some reason not previously included in the value of livestock on farms—can be estimated by methods recommended later in this report.

#### IV. DEFINITION OF AGRICULTURAL SECTOR, ASPECTS OF COMPARABILITY OF WEALTH AND INCOME CONCEPTS, AND AGRICULTURAL SERVICES

Census farms are the focal point of the "agricultural sector" universe. We seek to measure the total wealth used on census farms (plus small acreages of land not included in census farms as indicated below). This wealth may be owned within the agricultural sector (by operators of census farms); or it may be owned in another sector (largely by nonoperating landlords) and leased to farm operators in the agricultural sector.

Census farms are farms of 10 or more acres with a value of agricultural products sold in 1959 of \$50 or more, and farms of less than 10 acres with a value of agricultural products sold of \$250 or more. This definition was used in the 1959 census; it would need to be adjusted for earlier or later censuses to the extent the definition differed from that used in 1959.

Census farms do not include all places on which livestock or poultry are kept nor all places on which crops are harvested. In 1959, there were an estimated 800,000 places not qualifying as census farms, on which some livestock or poultry were kept or crops harvested. Approximately 570,000 of these places were under 10 acres in size and 230,000 over 10 acres in size. These places would be excluded in their entirety from the agricultural sector.

The land in census farms does not include all land used for pasture or grazing. In 1959, there were approximately 64 million acres of grazing lands administered by the U.S. Forest Service and used for grazing under a permit. Likewise, rangelands administered by the Bureau of Land Management of the U.S. Department of Interior, used under permit are not included as land in census farms. These grazing lands totaled approximately 161 million acres in 1959. This land, like land rented from individual landlords, constitutes part of the wealth used to produce farm products, and as such should be valued and included as part of the agricultural wealth leased from others. Provision for accomplishing this is included in the section of this report dealing with farm real estate.

Census farms, land in farms, and the value of land and buildings include a large number of places not used primarily for agricultural purposes. The 1959 census included 882,000 part-time farms and 404,000 part-retirement farms. These "noncommercial" farms represent primarily homes for persons having nonfarm jobs or for persons fully or partially retired. These accounted for less than 4 percent of all farm products sold. However, they contained 9 percent of all land in farms and accounted for 11 percent of the value of farmland and buildings.

Included in the noncommercial farms, as reported in the 1959 census, were approximately 3,000 institutional farms. These farms contained about 43 million acres of land, about 4 percent of the national total of farmland.



The Standard Industrial Classification System (U.S. Executive Office of the President, Bureau of the Budget, 1957) provides the following definitions of agricultural operations:

"Agricultural operations consist\* of the production of crops or plants, vines, and trees (excluding forestry operations); or the keeping, grazing, or feeding of livestock for animal products (including serums), animal increase, or value increase. Livestock as here used, includes poultry of all kinds, rabbits, bees, and fur-bearing animals in captivity, in addition to mules, asses, burros, horses, cattle, sheep, goats, and hogs. This division also includes activities such as dry lot or farm dairies (and feed lots); nurseries, greenhouses, sod farms; bulb, flower, and vegetable seed crops; mushroom cellars; cranberry bogs; apiaries and fur farms."

Our committee felt this definition of "farming operations" should be broadened for purposes of income-wealth comparisons to take in account operations carried out on census farms of a type "secondary" or incidental to the output of farm products.

Many farm operators, in addition to income earned from their farm activities per se, also realize income from sources other than farming. Some of this income is earned by use of land or other capital normally employed in the farming activities. Income from hunting and fishing rights, for example, involves the use of a farmer's land and perhaps his time and some of his equipment normally used for farming. Income from oil leases and mineral rights, also, may be derived from his land. In pricing farmland, it is a common practice to include the capitalized value of such income, so that it is virtually impossible to separate this component of farmland values from the component reflecting the capitalized value of income from farming only. Much of the same problem exists for farm equipment used for purposes other than farming per se. On the other hand while the income and wealth associated with farm residences are closely associated with farming, we think the data are adequate to permit separation.

Income from oil leases, mineral rights and recreational uses of all or part of the farm is thus derived from an incidental or secondary use of capital resources normally or originally used in farming.

Wealth used in the agricultural sector, therefore, is considered to include wealth that is not used exclusively for the production of farm products; wealth used jointly to produce farm products and also these secondary products is considered to be entirely agricultural wealth except—as in the case of farm residences—where a separation is possible.

To facilitate relating primary and secondary farm income to the value of the capital resources used to produce this income, for the purpose of measuring returns, it is therefore recommended that income totals from such sources be shown separately, if possible, in estimates of income of farm operators from off-farm sources. Rate of return measurements on a comparable basis will thus be possible.

Turning now to what is to be measured, we want to include all wealth (1) used to produce farm products and "secondary" products and (2) we want to know the sector of the owner of this wealth.

In the first place, the land, equipment, etc., owned and used by farm operators of census farms are of course wealth "in" the farm sector—both in a use sense and in an ownership sense.

Some farm operators own land and other wealth that they do not use exclusively, or at all, on the census farms they operate. This includes (a) the landlord activities of those farm operators who own land they rent to other farm operators and (b) the custom work that some farm operators perform on a fee basis for other farm operators. All of this wealth—the land rented to others, the equipment used for the custom work, and other such wealth—is considered as both used and owned in the farm sector. This treatment corresponds with that used by the U.S. Department of Agriculture in the farm income accounts, and adopted by the Department of Commerce in their national income and product accounts. However, in keeping with the overall plan of the wealth inventory and also because such information would be useful in its own right, provision is made for showing estimates of wealth rented within the farm sector.

Some persons or enterprises who are not farm operators own some farmland and other wealth used to produce farm products. We recommend treating this wealth (though used in the agricultural sector) as owned "outside the agricultural sector" as is now implied in the USDA and Department of Commerce treatment of farm income. On the other hand, in the "Flow of funds" accounts of the Federal Reserve Board, nonoperating landlords are considered as in the farm business sector. However, if adequate detail is shown, rearrangements of the data can be made as desired.

For some purposes it is desirable to show income by use of resources. Especially for productivity analysis, all resources used in an industry (regardless of ownership) should be included. Thus gross rent paid to nonfarm (that is, nonoperating) landlords for the use of these leased resources, which is now deducted from gross farm product and transferred to the real estate industry in the income accounts of the Department of Commerce, may be moved back into farm product in the farm sector for such purposes. Then both incomes and resources would be on a comparable basis.

#### *Agricultural services*

In addition to farm operators (including operators who do custom work), and nonoperating landlords, some other individuals and establishments own wealth that is used exclusively or in part in producing agricultural products. Much of this wealth is in the agricultural services industry, although a part is in other industries.

Very limited statistical information is available regarding the resources used for the performance of agricultural services. None of the agricultural services have been covered by agricultural or business censuses. As agriculture becomes more and more specialized and the span of operations on individual farms is narrowed, more and more agricultural operations are being performed by various custom operations, and service organizations. Failure to take such changes as these into account sometimes can lead to erroneous conclusions. For example, one of the most popular agricultural statistics is the number of persons fed per farmer, with the increases in this number implying gains in farm efficiency. Part of this gain, of course, is a result of increased use by the farm sector of products, labor, and capital goods from the other sectors. The lack of output, income, employment, wealth, and other data for this group of services constitutes a serious

gap in our basic statistical system and imposes a serious handicap on all studies relating to agriculture and related sectors.

The SIC classification of agricultural services, we feel, is in need of revision. In the first place, the classifications are at least partly obsolete—there are some services now being performed that are not listed (such as farm management services) and some of the services listed are no longer important (such as threshing). Furthermore, we would restrict agricultural services to those services performed for farmers and would exclude farm marketing services performed primarily for nonfarmers.

We would arbitrarily classify as "agricultural production services" those establishments in which more than one-half of their total income was paid to them by operators of census farms.

This treatment will result in a slight overstatement of wealth used in the agricultural sector that is provided by the agricultural production services. However, it will also be true that certain nonagricultural services may be providing services to farmers, and none of the wealth associated with these services will be included as wealth used in agriculture. We believe the overstatements of agricultural wealth will be approximately offset by the exclusions.

So far as agricultural wealth estimates are concerned, we would include as wealth used in agriculture all the land, structures, and equipment of the agricultural production services as defined above. Such wealth would be shown as leased by the farm sector from the services sector.

#### *Recommendations*

(1) That the classifications and concepts of agricultural services be studied carefully with a view of increasing their usefulness for the agricultural wealth estimates. The agricultural services would doubtless need to be studied in the context of the entire services sector.

(2) We tentatively recommend the following groupings of agricultural production services:<sup>8</sup>

1. Cotton ginning and processing.
2. Grist mills, including custom flour mills.
3. Poultry hatcheries.
4. Veterinarians and animal hospitals.
5. Miscellaneous animal husbandry services—animal breeding, boarding, and training of horses.
6. Corn shelling, hay baling, and threshing services.
7. Contract sorting, grading, and packing of fruits and/or vegetables for the grower.
8. Machinery and equipment leasing.
9. Bulk feed handling.
10. Crop dusting.
11. Bulk blending and direct application of fertilizer.
12. All other miscellaneous agricultural services—farm management services, fruit picking, grain cleaning, harvesting, plowing, etc.

<sup>8</sup> This proposed subgroup differs in the following respects from the present SIC arrangement:

1. Two new groups have been added: (a) machinery and equipment leasing, (b) bulk feed handling.
2. Crop dusting has been taken out of miscellaneous and upgraded to a separate group.
3. Farm management services has been added to the miscellaneous services group.

Those services now included in present SIC service groups classifications should be broken out and transferred to the new subgroup.

In establishments conducting services for both farm and nonfarm sectors, classification would be made on the basis of whether a majority of their income is derived from sales to farm or nonfarm users.

The proposed creation of an expanded subgroup of agricultural production services industries quite naturally raises the question of whether such data should be collected as part of the Census of Agriculture or as part of the Census of Business. This jurisdictional question, however, should not be too difficult to resolve inasmuch as both data gathering groups are qualified to collect the necessary data. At any rate questions of jurisdiction or responsibility should not be allowed to negate the real need that exists for such data.

Data for such industries should be collected in either census on (a) sales by customer (farm and nonfarm separately, and (b) value of each of the major categories of physical assets, e.g., land, structures, equipment, and inventories.

(3) It may be desirable to obtain directly from farmers data showing the source and amount of their expenditures for services. This would permit services to be allocated by economic class of farm, and would serve to check the data obtained from a census-type survey of the agricultural production service industries.

#### *Detail desired for agricultural wealth estimates*

Much of this is covered in the various sections of this report. We make this overall recommendation:

(1) For broad groupings—land, machinery, etc., the data be shown by States, except in areas of limited agricultural activity where some groupings of States would be satisfactory.

(2) For each State the data be further subdivided into four farm classes:

Large commercial farms—farm product sales of \$20,000 or more.

Medium size commercial farms—sales of \$5,000 to \$19,999.

Small commercial farms—sales of less than \$5,000.

Noncommercial farms.

Large commercial farms, as defined above, in 1959 would have included about 8 percent of the farms which produced 50 percent of the value of farm products sold; medium size commercial farms would have included 30 percent of the farms which produced 37 percent of the products; small commercial farms would have included 27 percent of the farms which produced 9 percent of the output; and the non-commercial group would have included 35 percent of the farms, producing 4 percent of the products. In 1964 and later years the large commercial farms would become relatively more important and the other three groups less important.

## V. VALUATION OF FARM REAL ESTATE

### *Definitions, concepts, limitations of present estimates*

Presently available valuations of farm real estate carried in the "Balance Sheet of Agriculture" and elsewhere in USDA statistics represent estimated current market values for all land in farms, as enumerated in the various censuses of agriculture, and include perma-

ment land improvements such as irrigation and drainage as well as farm dwellings and service buildings. Such estimates are available annually by States (except Alaska and Hawaii), and are calculated as of March 1 for each year. These estimates could be adjusted to January 1 by means of the index of average value per acre, as calculated by the USDA. These indexes are available for March 1, July 1, and November 1 of recent years.

Because these estimates are constructed at the census level of farms, and match census definitions as to land in farms, they contain the following deficiencies:

(a) Underenumeration, as determined by postcensus field checks. The land in farms reported by the 1959 census was estimated to be about 6 percent less than the true universe total. USDA has developed estimates of numbers of farms and land in farms taking underenumerations into account, but no valuation exists for such lands. However, if State average values for all land is attached to the land that was missed, the 48-State total is increased about \$6 billion for 1959, 5 percent more than was reported in the census.

(b) All rural properties that meet the definition of a farm are included in the value estimates. Farms are further classified in the agricultural census into two main classes—commercial and noncommercial. Noncommercial farms are essentially part-time and retirement places that could be removed from the agricultural sector if the wealth accounts are to be used as a measure of the principal assets used in agricultural production.

(c) Land in farms, as defined by census, includes substantial acreage of publicly owned lands in the Western States. Conversely, there is also a significant acreage of federally owned land used for grazing, but not included as land in farms because such lands are used jointly with other ranchers under grazing permits. In the first instance, an estimate of the value of publicly owned land would be necessary if it was desired to classify lands by sector of ownership. In the second instance, the value of such permit lands would need to be determined and added to land in farms if it was desired to obtain a measure of all lands used in agricultural production. The valuation of such public lands is more properly a problem to be handled by the working group concerned with natural resources, or with the government sector.

(d) Census valuation of land in farms include nonagricultural values to varying degree, depending upon the geographic area. In the Northeast, reported values are substantially above strictly agricultural values because of proximity to large urban centers and the potential site value of much of the land now in farms in this region. Similar site values are attached to farmland in metropolitan counties elsewhere in the country, notably in California and Florida. A part of the speculative value of subsurface minerals, particularly oil and gas, is also included in the values of farmlands reported in Texas, Oklahoma, and other States where such minerals are widespread. By no means all of the market value of minerals is included in land values, however, because mineral rights have been severed by separate deeds on many properties. As indicated previously, we are seeking to take some

account of as many of these farmland characteristics as possible by suggesting changes in the farm income accounts. Mineral rights associated with farmland may be of concern to the working group dealing with the valuation of natural resources.

Additional problems of measurement result from the need to allocate the total value of farm real estate between land and buildings. An annual series intended to measure production assets which appears in the Balance Sheet excludes the value of operators' dwellings. Separate estimates of dwellings and service buildings also have been made for use in the farm income estimates, but these are based on fragmentary, and often outdated benchmarks. The sharp decline in the number of farms in recent years has greatly complicated the construction of such estimates. A new survey conducted in April 1963 may provide the basis for more refined estimates than are currently available.

#### *Valuation in constant dollars*

The initial step in such estimates is a valid allocation of total real estate values between land and structures. The approach followed in the joint National Bureau-U.S. Department of Agriculture study of physical capital in agriculture<sup>9</sup> was continued until about 1960 in the Balance Sheet accounts. However, some basic discrepancies have developed between market value estimates for buildings, and the net investment estimates carried in the farm income accounts. Briefly, the perpetual inventory method of valuing buildings produces estimates that are \$10 to \$15 billion higher than the estimate of current market values of buildings. This difference can be attributed chiefly to the decline in numbers of farms, and the resultant loss in the number of sets of farm buildings which was not specifically allowed for in the farm income estimates. Recent work appears to have removed most of this difference, although the results from the April 1963 survey referred to above have not as yet been incorporated into the revised estimates.

Even if the depreciation and capital investment accounts for buildings can be reconciled with changes in market values, difficult problems remain in the calculations of constant dollar valuations. The minimum approach would be to establish values for several broad categories of land use in the benchmark year, then to measure the shifts in acreages of land in various use categories that occur in subsequent years. The resulting constant-dollar valuations would then reflect changes in land quality, as well as changes in total acres in farms. However, value differentials by class of land are unobtainable from market sales data, and can only be roughly approximated by regression analysis. Judgment estimates supplied by farmers are available for irrigated and nonirrigated cropland and for pasture land. These were used in preparing State estimates for 1960 and published in the June 1962 issue of *Farm Real Estate Market Developments*, issued by the U.S. Department of Agriculture. Considerable refinement would be needed in these estimates if they were to be used as part of the basis for constant-dollar estimates.

<sup>9</sup>Tostlebe, Alvin S., "Capital in Agriculture: Its Formation and Financing Since 1870." A joint study by the National Bureau of Economic Research, Inc., New York, in cooperation with the Bureau of Agricultural Economics (now the Economic Research Service), U.S. Department of Agriculture. Princeton University Press, Princeton, N.J., 1957.

A more refined approach would require the development of a gross investment account with respect to land, and also an offsetting account to recognize depletion and loss of capital value by various means. The gross investment account would include both private and public investments that become incorporated in land, such as drainage, irrigation, soil conserving structures, flood protection, upgrading of highways, and other off-site investments which contribute to agricultural output, reduce the cost of production inputs, or increase the price received for agricultural products. A new highway which improves access to a fluid milk market, for example, may substantially increase the net returns from farms served by the new highway, or make it possible to produce more profitable crops than before. How much of the total cost of such public investment is directly reflected in market prices is difficult to determine. Also, only fragmentary data are available to measure the extent of private investment in land improvements.

Even though acceptable solutions could be found for such problems, costs of land improvements are not necessarily directly reflected in market values nor in the productivity of the land resource. Some types of investments may enhance land values by more than their cost, while others may be only partially recoverable in the market. Public investments in land improvements are especially difficult to appraise in these respects.

Although land does not depreciate in the same sense as buildings, numerous examples of different kinds of depletion can be found. Changes that result in a downgrading in land use from cropland to pasture, or pasture to forest may be accompanied by a loss of capital value. Irrigated lands become waterlogged or accumulate salts which forces the shifts of such lands to lower-profit crops. Ground water levels have declined in some areas, increasing irrigation costs, and threatening eventually to make irrigation infeasible. Yields of orchards, vineyards and groves, likewise, decline after a period of years. Such deterioration of soils could be treated in much the same manner as depreciation of buildings. However, comprehensive data are almost totally lacking with respect to the investments made in such types of land improvements, and the number of years over which depreciation should be charged. Likewise some attention also should be given to the stock of plant nutrients stored in the soil in which withdrawals as a result of crop production would be matched against fertilizer applications to arrive at net gains or losses in soil fertility. Such changes have occurred over long periods of time in other countries, and this may be an appropriate time to initiate work in this area. Considerable exploratory work would need to be done with soil scientists and agronomists to determine the validity of the stock concept of soil-held plant nutrients, the empirical evidence now available, and the research techniques needed to yield definitive results.

#### *Allocation of value of residences on farms between farm business and household sectors*

Considerable discussion has been directed to alternative concepts for handling the valuation of dwellings on farms. Present estimates of values of farm real estate include all dwellings on farms, including those occupied by farm operators, workers, and nonfarm families.

One approach, followed in the present estimates of farm production assets as developed by the U.S. Department of Agriculture, is to exclude the value of dwellings from the asset accounts. When returns to these production assets are computed the imputed rental value of dwellings is excluded from the income account. The rationale here is that dwellings on farms represent a household investment entirely separate from the farm business.

An alternative approach, which would have merit in achieving greater consistency among sectors, would be to retain a part of the value of operators' dwellings in the farm business sector, and allocate the remainder to a nonfarm account. Present tax laws which permit an allocation of certain expenses associated with the operators' dwelling as a deductible farm business expense support this approach. We have no information as to how widely this practice is followed, nor the basis used by taxpayers in making the permitted allocations. Internal Revenue has suggested guidelines in terms of the proportion of the total floor area of the structure that is devoted to business use. Implementation of this concept would likely require a rather arbitrary determination of the business-household ratio as only judgment estimates could be obtained directly from farmers. In view of a series of problems that becloud the issue we recommend that no account be taken of the small portion of the value of farm residences that could properly be considered essential to the conduct of the farming operations.

The value of all dwellings on farms should be allocated outside the agricultural sector. When comparisons of wealth estimates with income estimates are made, the imputed rental value should be transferred from the present farm income account. These accounts presently include the imputed rental value of all dwellings on farms in gross farm income in part because farm expense estimates include the expenses on all dwellings.

#### *Valuation by sector of ownership*

In addition to the private-public sectoring referred to previously, it will be necessary also to allocate privately owned land in farms between farmer and nonfarmer landlords. The present basis for this allocation in rental estimates is the physical residence of the landowner, as determined by a benchmark survey many years ago. Substantial improvement would be possible by using recent agricultural census data with respect to the acreage of land owned by farm operators and rented to others; the difference between this figure, and total land rented from others (also a census figure) can be assumed to be land rented from nonfarmers. A small number of these "nonfarm" individuals may physically reside on farms as fully retired farmers and the like but they would be treated as if they were a part of the nonfarm sector. Such discrepancies are bound to exist between an occupational, and a residential classification, but the occupational basis for classification is the most compatible with classifications used in other sectors.

#### *Recommendations*

1. The 1969 Census of Agriculture is likely to provide the best benchmark of the market value of farm real estate. This estimate should be adjusted for underenumeration, and further allocated between commercial and noncommercial farms, as these may be defined at that time. The feasibility of obtaining farmers' estimates of market values for



several major classes of land (cropland, pasture, etc.) in their farms also should be explored.

2. A supplemental benchmark survey should be conducted, either as a part of the 1965 or the 1970 Agricultural Censuses, or as a part of a special census of structures, to determine a basis for the allocation of total value of farm real estate between land and structures. Farm structures should be further allocated between operators' dwellings and service buildings.

3. Research should be undertaken to develop appropriate capital investment and "depreciation" accounts for land, apart from structures, which will provide a basis for developing and maintaining estimates of the value of farm real estate in constant dollars.<sup>10</sup>

4. Several specific questions and appropriate tabulations should be planned in connection with the 1969 Agricultural Census to permit allocation of market values of farm real estate by sector of ownership, as well as by sector of use. This would require specific determination of the acreage and market value of publicly owned lands included in farms. Data on land owned by private landlords can be obtained from present censuses of agriculture.

## VI. CROPS

### *Data available*

Estimates are available of the stocks of most major crops at mills, elevators, warehouses, and processing plants as of January 1. The onfarm inventory position comes from estimates of the Crop Reporting Board, SRS, USDA, and includes all crops stored on farms, including crops under loan to the Commodity Credit Corporation. The CCC owned or controlled stocks are reported by the Agricultural Stabilization and Conservation Service. Data are available both for stocks on farms under CCC loan and for stocks not under loan.

For certain crops whose stocks are not estimated by the Statistical Reporting Service, it is assumed that the quantity held by farmers for sale as of January 1 represents the farm inventory. For example, peanut stocks on January 1 are estimated as the difference between the total quantity to be sold from the crop year production and the quantity actually sold or put under loan through December.

Using the bushelage or poundage data reported as the January 1 inventory estimates, a value estimate of the farmer-owned crops stored on and off farms (including crops under loan to CCC) can be obtained covering 27 crops—wheat, buckwheat, rye, rice, soybeans, cottonseed, flaxseed, peanuts, corn, barley, grain sorghum, oats, hay, corn silage, corn forage, sorghum forage, cotton, cabbage, onions, potatoes, broom-corn, dry edible beans, dry field peas, tobacco, tung oil, and seeds for hay and pasture crops.

Prices received by farmers on December 15 for the various items are used as the best available indicator of the unit price of the various items.

For most of the major items for which data are available, regional and State allocations can be made with little difficulty.

Data for Alaska and Hawaii are not available in most cases. However, increasingly in the next several years, most series will likely include data for these two States.

<sup>10</sup> See footnote 6.

Several important product items on farms are not covered in periodic SRS reports. These include forest, nursery, and greenhouse products on farms.

Also, growing crops (not harvested or still maturing) on January 1 are excluded from all inventory valuations. Winter wheat and barley, for example, are in the ground and citrus products are on the tree.

#### *Recommendations*

(1) For items for which inventory data are not available such as forest, nursery, and greenhouse products we recommend estimating such values by calculating the ratio of the inventory value of all known crop items to cash receipts from marketings of these crop items; this ratio would then be applied to the estimated cash receipts of the items for which inventory data are not available.

(2) For goods in process, such as the winter wheat crop, we recommend estimating the per acre outlays incurred up to January 1 for major inputs such as seed, labor, herbicides, and others (not including overhead costs). This estimated outlay would be applied to the estimated fall wheat plantings as reported in the USDA intentions report. For citrus, we recommend somewhat the same procedure as for wheat in attempting to estimate the value of the crop on the tree or in process of maturing on the tree.

## VII. FARM MACHINERY AND EQUIPMENT

### *Data available*

Numbers of autos, tractors, and trucks on farms are available by States through 1959. From 1960 on, motor vehicle numbers have been estimated on a U.S. basis and distributed among the States on the 1959 basis.

Estimates of the numbers of certain types of farm machinery are prepared annually for the United States by the Farm Production Economics Division, ERS, USDA; Census data supply benchmarks by States. For the minor types of farm machines and equipment on farms, the National Survey of Farm Machinery, 1956, conducted by Agricultural Research Service, USDA, furnished benchmark data for the United States.

Prices by States are available for new tractors and selected items of farm machinery from the Statistical Reporting Service, USDA. Unit prices paid by farmers for new autos and trucks are not available by States but State-to-State differences in prices paid are probably small. Data on prices of used farm machinery and equipment are scant and of doubtful accuracy.

Data on the value of farm machinery and equipment on farms are much less reliable than are the data on numbers. In making estimates of value the USDA values the stock on farms at estimated current replacement cost. The value of the stock on farms is the cumulative total resulting from carrying forward yearend depreciated values. There have been no benchmark surveys of the total value of all farm equipment since 1945. All computations are made on a constant dollar basis and converted to current dollars by use of suitable prices paid indexes. The current replacement cost of capital equipment on farms is conceptually the dollars necessary to replace existing capital equip-

ment with similar equipment of the same capability and with the same remaining "life."

#### *Limitations and recommendations*

The overriding limitation on an inventory of farm capital equipment lies in the absence of reliable State, regional, and national estimates of values. Currently, the estimate of the stock value is based on an outdated benchmark, and on annual data since the year of the benchmark that are incomplete and of unknown accuracy.

Sector of ownership is unknown for farm capital equipment.

In order to meet the needs of a "Wealth Inventory" for agriculture, we recommend a benchmark survey that would provide State data as follows: (1) Type of equipment on farm; (2) age of equipment; (3) value of equipment—both current market value and original cost; and (4) ownership and use of equipment by sector. This survey should be repeated, at least on a sample basis, to provide more timely estimates. A survey may yield information on age and type of equipment by economic class of farm, by regions, and perhaps by States. However, response to value type questions is more difficult and pilot surveys may have to be undertaken and compared with available data such as used machinery prices to determine whether respondents can approximate the value of their capital goods at current prices.

Furthermore, such a survey of machinery stocks may aid in reconciling the several depreciation rates considered applicable to capital goods used in agriculture. For example, the USDA considers the tractor depreciation rate to be about 18.5 percent annually. Based on a study of used machinery prices, Zvi Griliches of the University of Chicago estimates the rate to be around 12 percent, while the IRS apparently suggests a rate somewhat over 20 percent annually.

### VIII. LIVESTOCK

#### *Data available*

The Statistical Reporting Service reports the January 1 position *on farms* of numbers of cattle (by age and classes); hogs, sheep, chickens, and turkeys. Livestock and poultry *not on farms* are excluded. An inventory value of livestock on farms is arrived at by using the average price per head for various classes of livestock and poultry reported as prevailing in localities at the time of inventory by crop reporters.

Current estimates do not include horses or mules on farms—this presents a minor problem in estimating price per head since a quantity figure can be arrived at with reasonable accuracy. Goats on farms are reported for Texas only on both a quantity and price basis (i.e.,  $p$  times  $q$  = \$25.8 million, January 1, 1963).

Commercial broilers are not included in the inventory position as reported.

In general, State and regional data are available in reports on the livestock inventory of U.S. farms.

#### *Recommendations*

(1) Our recommendation is to obtain a cumulative total of weekly broiler placements for the 10 weeks prior to January 1, and adjust this total for under enumeration (reports are made for only 22 States). Since on the average the broilers would be only half grown we would take only one-half of the cumulative total. We would apply an average farm price for commercial broilers to this estimated number to

arrive at a January 1 inventory value figure for the United States and then allocate this total to the States based on placements and other data.

(2) The inventory position of several minor "livestock" items such as ducks, geese, pigeons, rabbits, and fur-bearing animals on farms are not reported. For these items, we recommend the application of the ratio of the value of the stock of certain poultry items to cash receipts for those items to be applied to the estimated cash receipts from marketings total for miscellaneous and other livestock items.

IX. FINANCIAL ASSETS AND CLAIMS

Financial assets and claims, together with the value of the physical assets used in agricultural production, residences on farms, and "household furnishings and equipment," are combined into "The Balance Sheet of Agriculture" which is published each year by the Department. Physical assets are treated elsewhere in this report and will be referred to here only in their Balance Sheet context. The estimates of farm debts and to some extent the financial assets have a wide variety of uses apart from their use in the Balance Sheet.

TABLE 1.—Balance sheet of agriculture, January 1, 1963

ASSETS		<i>Billion dollars</i>
Farm land and buildings (including residences).....		142.8
Physical production assets other than land and service buildings, total.....		45.9
Livestock.....		17.2
Machinery and motor vehicles <sup>1</sup> .....		19.5
Crops stored on and off farms.....		9.2
Household furnishings and equipment.....		8.7
Financial assets.....		18.4
<b>Total</b> .....		<b>215.8</b>
LIABILITIES		
Real estate debt.....		15.2
Non-real-estate debt, total.....		16.6
Owed to reporting lenders (except CCC loans).....		8.5
Owed to nonreporting lenders.....		6.0
Owed to Commodity Credit Corporation.....		2.1
<b>Total debt</b> .....		<b>31.8</b>
Proprietors' equities.....		184.0
Financial assets were reported in the following detail:		
Liquid financial assets:		<i>Billion dollars</i>
Currency.....		1.9
Demand deposits.....		4.0
Time deposits.....		3.3
U.S. savings bonds.....		4.4
<b>Total</b> .....		<b>13.6</b>
Other financial assets: Investment in cooperatives.....		4.8
<b>Total financial assets</b> .....		<b>18.4</b>

<sup>1</sup> Includes the estimated total value of automobiles on farms rather than only the 40 percent of value estimated as used for farm production purposes.

*General comments*

1. Assets and liabilities are included that are associated with farm household activities, as well as the assets and liabilities connected with the production of farm products or "secondary" type products.

2. Assets and liabilities of farm operators, and the farm-related assets and liabilities of all landlords, including nonfarm landlords, are both intended to be included in the balance sheet.

3. Generally the data on farm debt have a much stronger statistical base than the financial assets. Judgment is liberally used to supplement the scarce data on the financial assets. Although of relatively small magnitude, the financial asset estimates carried in the balance sheet are probably in greater need of improvement than are any of the other asset or liability items which have been considered in this report.

*Available data and their limitations*

*Currency.*—Estimates are based on the assumption that farmers hold the same amount of currency in relation to their demand deposits as do all individuals, including farmers. It is not known how accurate this assumption is. Nothing is known about whether reasonable State figures could be derived.

*Demand deposits.*—For a number of years up to 1960 demand deposits owned by farm operators were estimated by the Board of Governors of the Federal Reserve, based on an annual sample survey of commercial banks. The estimates were intended to cover only the deposits held by farmers as businessmen; nonbusiness deposits were excluded. The estimates were reported by Federal Reserve districts. Since 1960 the Board has not been making its surveys, pending study of various aspects, and it is not clear when the survey will be resumed, or whether farm operators' business-type demand deposits will be reported separately.

In the meantime USDA estimates are based primarily on changes in total demand deposits held by Federal Reserve member banks in cities of under 15,000 population. It is not known how good these estimates are. Presumably regional estimates could be made on this basis, but probably not State estimates.

*Time deposits at banks.*—Time deposits are estimated as a percentage of the estimate for former-owned demand deposits at banks. This percentage is derived in part from yearend ratios of time deposits to demand deposits in banks in 600 counties which, based largely on data in the 1940 census, were defined as "primarily agricultural counties." One question is whether this method of estimating agricultural totals from data for primarily agricultural counties is appropriate now—because the county has become so much less rural than it was in earlier years.

*U.S. savings bonds.*—Farmers' ownership of savings bonds is based on data and judgment. The data are mostly annual U.S. Treasury Department reports on purchases of the various types of bonds in some 600 agricultural counties. Per capita farm purchases by regions are surmized from these data. Farmers are assumed to redeem bonds more slowly than nonfarmers; this assumption is based on some bond redemption data by counties that were available for 1945-52. These estimates of purchases, together with estimates of accrued interest, are added to the previous year's estimated outstanding balance, and redemptions subtracted.

Regional estimates of annual bond purchases by farmers have been published on occasion, but not estimates of the value of farmers' total holdings of bonds.

It is not known how good these estimates are, but they could probably be improved considerably. Consideration is currently being given to obtaining certain sample data on bond holdings and other liquid assets of farmers in the next census sample survey of agriculture.

*Investments in farm cooperatives.*—Balance sheet data on this item are obtained from several sources, mostly the Farmer Cooperative Service of USDA, the Rural Electrification Administration, and the Farm Credit Administration. The Farmer Cooperative Service has underway quite a comprehensive survey which will yield better estimates than heretofore of the net worth of marketing and purchasing associations (which together make up about one-half the total of farm cooperative investments). State estimates will be obtained from the survey data.

A problem in this area is that some of the net worth of farmers' cooperatives is owned by nonfarmers.

*Financial assets not included.*—Some important farm business and farm consumer financial assets are not included in balance sheet estimates because of lack of data:

1. Corporation stocks, various bonds other than U.S. savings bonds.
2. Savings in financial institutions other than commercial banks.
3. Cash value of life insurance.

#### *Goals for financial assets and claims reporting*

Since detailed data on financial assets and liabilities are not considered as essential to the accomplishment of the national wealth inventory as are some of the physical asset data, it may be satisfactory to report these items in less detail, and perhaps with less accuracy, than is desired for the physical asset items. We, therefore, suggest these as reasonable goals:

1. To present data for suitable regional groupings of States, rather than for individual States.
2. To improve the accuracy of the financial asset data used in the balance sheet and to broaden the coverage of financial assets.
3. To permit preparation at the regional level of a variety of balance sheets as follows:

- (1) Operators of census farms showing:
  - (a) Production and consumption assets and liabilities separately.
  - (b) Showing owned and rented assets separately.
  - (c) Showing the four groupings of farms separately (large, medium, and small commercial, and noncommercial).

#### *Recommendations*

To accomplish the goals listed above we make these recommendations:

1. To improve the financial asset figures, we recommend first a pilot survey, and later a survey of the necessary size for making regional estimates:

- (1) Of financial assets now in the Balance Sheet.
  - (2) Of financial assets not now included in the Balance Sheet.
- (This recommendation to be coordinated with the household wealth

working group, and the financial claims working group; and also plans for the 1965 Sample Survey of Agriculture.)

2. As part of the pilot survey above, to determine whether there is a feasible way to obtain from respondents the data needed to allocate financial assets between business and household purposes. Otherwise this allocation may need to be done arbitrarily.

3. A part of the above survey, or by including additional questions on debt in the samples survey of agriculture, to obtain the data needed to allocate debts between business and household purposes.

4. Estimates of debt held by "nonreporting lenders" are being considerably improved as a result of the 1960 Census Sample Survey of Agriculture. Future benchmark surveys of similar nature will be needed.

5. The debt questions in subsequent sample surveys of agriculture should be of such nature that farm debts of nonfarm landlords can be separated from those of farm operator landlords. Also, at some time the size of the sample should be increased to permit needed regional estimates.

6. The census mortgage surveys of operators and landlords, if continued at 5-year intervals, should largely care for the mortgage debt needs.

7. Some part of the farm debt, especially mortgage debt, is owed within the agricultural sector. How this is to be treated will depend in part on overall wealth inventory study decisions.

8. Commodity Credit Corporation loans, and the assets securing these loans, should be excluded from the balance sheet data.

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APPENDIX II: PART F

REPORT OF THE WORKING GROUP ON NATURAL  
RESOURCES WEALTH

Prepared by NEAL POTTER



## MEMBERSHIP OF THE NATURAL RESOURCES WORKING GROUP

Bruce C. Netschert (chairman), National Economic Research Associates, Washington, D.C.

Neal Potter (secretary), Resources for the Future, Inc., Washington, D.C.

### MINERALS SUBGROUP

Orris C. Herfindahl (chairman), Resources for the Future, Inc., Washington, D.C.

Richard Kruizena, Humble Oil & Refining Co., Houston, Tex.

Joseph Lerner, U.S. Office of Emergency Planning.

Milton Lipton, Walter J. Levy, Inc., New York, N.Y.

Vincent McKelvey, Geological Survey, U.S. Department of Interior.

Bruce C. Netschert, National Economic Research Associates, Washington, D.C.

Rexford C. Parmelee, Bureau of Mines, U.S. Department of Interior.

Vivian Eberle Spencer, Mineral Industries Branch, U.S. Bureau of the Census.

William A. Vogely, Bureau of Mines, U.S. Department of Interior.

### TIMBER RESOURCES SUBGROUP

Albert C. Worrell (chairman), School of Forestry, Yale University.

Samuel T. Dana, University of Michigan (emeritus).

James C. Rettie, U.S. Department of the Interior.

A. C. Shaw, Champion Paper Co., Asheville, N.C.

Ellis T. Williams, Forest Service, U.S. Department of Agriculture.

### WATER SUBGROUP

Nathaniel Wollman (chairman), University of New Mexico, Albuquerque, N. Mex.

Eugene W. Weber, Corps of Engineers, U.S. Army.

Douglas R. Woodward, Geological Survey, U.S. Department of the Interior.

### FISH AND WILDLIFE SUBGROUP

Giulio Pontecorvo (chairman), Graduate School of Business, Columbia University.

Walter H. Stolting, Bureau of Commercial Fisheries, U.S. Department of the Interior.

Karl F. Stutzman, Bureau of Sports Fisheries, U.S. Department of the Interior.

### PUBLIC LANDS SUBGROUP

Marion Clawson (chairman), Resources for the Future, Inc., Washington, D.C.

Russell D. Lloyd, Bureau of Land Management, U.S. Department of the Interior.

Orin E. Schuyler, Division of Property Management, U.S. Department of the Interior.

## PREFACE

The Working Group on Natural Resources Wealth met as a whole on September 9 and December 11, 1963.

The Subgroup on Minerals met on September 9 and October 2, 1963.

The Water Subgroup met on September 9 and November 23, 1963; it met briefly without the Chairman on October 29, 1963.

The Timber Resources Subgroup met on September 27 and December 11-12, 1963.

The Fish and Wildlife Subgroup met on September 9, 1963, and January 31, 1964.

The Public Lands Subgroup met on October 3 and October 29, 1963.

Mr. Allen V. Kneese, of Resources for the Future; Mr. James Flannery, of the U.S. Public Health Service; and Mr. Walter Langbein, of the U.S. Geological Survey, assisted at certain stages of the Water Subgroup report. Mr. Donald C. Duncan of the U.S. Geological Survey assisted as alternate for Mr. McKelvey. Mr. John Ryan assisted as alternate for Mr. Kruizenga.

Much assistance and many helpful suggestions were given by Mr. John W. Kendrick and Mr. Joel Popkin of the staff of the study.

All members of the working group have aided in the preparation of, and have had an opportunity to review a draft of this report; however, final responsibility for the group report rests with the group secretary. The subgroup reports were drafted in each case by the chairman of the subgroup; these drafts were discussed, modified, and approved by members of the subgroup, except as noted by footnotes of dissent or supplementary views.

NEAL POTTER.

## NATURAL RESOURCES

### I. POSSIBLE USES OF AN INVENTORY OF NATURAL RESOURCES

Inventories of the physical resources available to the Nation can be of great importance to both public and private policymaking. Such estimates contribute to rational decisions related to conservation and development of natural resources, to national defense policies in stockpiling and other critical fields, to import and export policies, to policies for depressed areas, to retraining of workers, etc. Solutions to many problems related to geopolitics—alliances, defense preparations, foreign aid, etc.—may be aided by such information. Important decisions in the field of private business also depend in part on data in this field: orderly marketing, avoiding the periods of speculative excesses resulting from shortages or surpluses; investment in exploration, development and extraction facilities; investments in conservation, holding, and development of resources; the economical location of manufacturing facilities; etc.

The simple physical counts of available units are of course not adequate as a basis for developing answers to all the questions that arise in these fields. Geographic location, physical qualities, freedom from impurities, degree of accessibility, costs of extraction, and similar attributes need to be specified. Each of these aspects is generally somewhat complex and in the last analysis can best be described in quantitative terms. These measurements generally have no common denominator, so it is desirable for practical purposes to place an economic value upon the resource, as a measure of the various quality aspects taken together. The importance of a timber stand to the national wealth, prosperity, or security is dependent not only on the volume of the stand, but on its average size, freedom from defects, cost of transporting to market, year of expected salability, etc. The significance of an oil deposit depends on its total quantity, depth, gravity, sulfur content, gas pressure, distance from refineries or tide-water, etc. These qualities can be summarized, for many purposes, in one datum—market value.

Thus, value data are a most important adjunct to physical data to make possible rational decisions in the allocation of funds to conservation; to projects of exploration, research, or development; to research and development for the production of substitutes; to the finding of proper answers in the fields of area redevelopment, local taxation bases, etc. Without value figures, it is impossible to determine the most economical course of conduct; lack of such data is one of the causes of the numerous decisions made irrationally and wastefully in this portion of the national economy. There are serious charges that much of our most valuable heritage of natural resources has been wastefully used and foolishly allowed to deteriorate; there are also

charges that many conservation efforts are largely wasted expenditures. Even moderately good wealth data would go far to guide public and private decisions into more economical and productive lines.

## II. PROBLEMS OF AN INVENTORY

The enormous dimensions of the problems which a moderately good wealth inventory could contribute to solving are matched by the dimensions of the difficulties involved in getting such data.

In principle the ways of making a wealth inventory in the field of natural resources<sup>1</sup> and the importance of making such an inventory are no different from the problems and values in any other field of the economy. Natural resources are traded in the market, they are involved in economizing decisions, they should not be wasted, they are substitutable for each other and for manmade goods in greater or lesser degree. Nevertheless, they have certain peculiarities in common which make them difficult to handle:

1. They are nonreproducible, either for long periods or forever.

The possibilities of substitution, and of devoting more capital to refining low-grade ores, to exploring for and to reducing the use of scarce resources, etc., somewhat impair this generalization, but it is a significant one nevertheless. While fish, wildlife, and timber reproduce, the time required to establish or restore commercially usable stocks is quite long compared to that needed for production of large outputs of manufactured products and most farm products. Water supplies are renewed by the rains at least annually; but the supply available for actual consumption is rather strictly limited in any given river basin.

2. Natural resources have traditionally been free for the taking (originally from the Indians or from the Government) thereby having an initial price of zero.<sup>2</sup>

3. The extent and quality of the physical inventory is often unknown, as in the case of most minerals and many varieties of fish. Many of the important physical aspects of water and of lands are also unknown.

1. The quality of nonreproducibility makes natural resource materials unstable in price, since supply is quite inelastic as contrasted with a nearly infinite elasticity for many manmade goods. Demand also tends to be inelastic because of the quality of uniqueness or poor substitutability. Highly variable prices make difficult the writing of price tags even for a known physical inventory.

2. The tradition of a zero price for the first claimant of resources newly discovered or made available, makes historic price or "book value" unusable for natural resources in many cases. It is true that sales by the original claimants and by subsequent owners of resources have eliminated this problem for most land in private hands but the problem still remains for most of the public lands and remains in the case of water (except where water rights are sold separately from land), and in the case of fish and wildlife. The problem also persists

<sup>1</sup> Here taken to include all natural resources, industries, and assets except agricultural and site land.

<sup>2</sup> In recent years Federal policies have changed with respect to some important mineral leases and timber sales.

in the case of minerals, because free staking of claims is permitted on the Federal lands and because transactions in known or proved mineral properties are uncommon except for petroleum and gas.

3. The lack of knowledge of physical inventories may make impossible a straightforward census in the case of most minerals. It may still be possible, however, to get value and quantity figures on *developed* properties; and to supplement these data by figures on the *total* physical inventory, estimated by methods of geological inference.

The great difficulty of finding market values in the natural resources field has led to exploration of the possibility of capitalizing an expected income as a means to estimating values. The explorations have however led to a general rejection of this approach because where resource commodities are sold in the market, the great bulk of their prices usually consists of the costs of locating, extracting, and processing them. Much doubt was expressed as to whether mineral reserves would show any value at all in many cases, if the price in the ground were estimated from the market price of a processed ore or an ingot metal by subtracting the costs of extracting and processing it. Small errors in estimating these costs could lead to large relative errors in the residual value assigned to a ton of the mineral; and a significant error in the price per ton of the mineral could lead to a large error in the value assigned to the total tonnage in estimated reserves.

The general lack of a market—or in other terms, the general tradition of making goods free for the taking—may make valuations of water resources and of fish and wildlife impractical. There are undoubtedly large social values attached to these resources; but these values can be reduced to dollar or market terms only through the use of complex and debatable analyses which make values in these fields a better subject for special studies in universities than for a census-type inventory. The inventory may well, however, cover the physical aspects of these resources, since these data have great usefulness apart from value figures. In the case of water, the need for systematic planning for development of the resource has long been recognized; improved hydrologic and water-quality data are needed for this purpose. These data can also furnish important basic material for the value studies mentioned above, which can lead to further great improvements in public and private planning. Value data can be collected in these fields on the structures and equipment used to capture and handle the resource: dams, conduits, sewers, boats, fishing gear, etc.

### III. SUMMARY CONCLUSIONS

The diverse natures of the industries and of the problems that come under the heading of "Natural Resources" led to the formation of five working subgroups to deal with them:

- (1) Minerals.
- (2) Timber resources.
- (3) Fish and wildlife.
- (4) Water.
- (5) Public lands.

The reports of each of the subgroups appear at the end of this group report. Their conclusions are summarized here, with a few comments.

*Minerals.*—It is assumed that the considerable investments in ore mills, transportation equipment, etc., can best be valued by the methods

that will be used in manufacturing. Mineral reserves and their inseparably associated extraction facilities, such as wells, shafts, valves, elevators, etc., should be valued by (a) using the prices in sales of comparable properties, in the case of oil and gas; (b) simply asking the owners to estimate present values in the cases of all other minerals (checking this latter category by estimates of other knowledgeable parties). Annual updating would be based on capital outlays and depreciation and depletion allowances, probably on an annual sample basis, as income tax data are probably not usable for this purpose. Quinquennial censuses would probably require major adjustment of the annual series for the most recent 5 years, as mineral discovery and development is a notably uncertain and variable line of enterprise.

*Timber resources.*—A good physical inventory of standing timber is now available, as of 1952 and as of 1962, prepared by the U.S. Forest Service. Valuations are lacking.

For solid stands of mature timber, valuation seems fairly simple. The physical aggregates, by categories, can be multiplied by the prices established in market sales of "comparable" stands.

In the case of mixed stands of mature timber and growing stock or of growing stock alone, one cannot properly value the timber without knowing its opportunity to remain on the land and grow to maturity—in other words, the land and the growing timber are a unit that cannot be valued separately. The timber resources subgroup proposes that the valuation be done on an acreage basis, by finding prices on market sales of comparable land with growing stock on it. It appears to this writer, however, that only the greatest care can prevent the mixing of speculative values on such land with its value as a timber resource. A great deal of timbered land has value for recreational, suburban residential, commercial, or industrial purposes. It would seem to be a better approximation to the value of the timber resource if the volumes of all marketable or accessible growing stock were estimated separately from the value of the land, probably by the use of estimates based on sales of tracts where speculative values for other purposes are known to play no part; or by discounting the value of a mature stand from the year in which maturity is expected. A few cases, in which small timber values will be lost through premature cutting at the time of bulldozing for suburban development or the like, will not cause a great error in the value of the total timber resource; but erroneous inclusions of speculative values of land could cause large errors in the valuation placed on the timber resource. Moreover it will not be possible to ascertain any values of timber on the large acreage of farm woodlots unless it is done by the method suggested here. Most farm woodlots are sold as part of farms, and timber values can probably not be ascertained at all except by some method which applies a timber price to a volume of wood.

If the problem of pricing stumpage can be solved along these lines, the necessary physical data to which to apply to such unit prices is available in good detail from the forest surveys conducted by the U.S. Forest Service.

*Water.*—A great deal of physical data with respect to waterflows and qualities is needed to prepare programs to meet effectively the Nation's rapidly growing needs for water; the subgroup's report indicates how very extensive are the requirements in this area. Valuation

of water is unfortunately made difficult or impossible in most cases because charges for water, beyond the cost of collection and distribution, are rare. The water rights transactions in the arid West are the principal instance of such a market value. The subgroup nevertheless proposes some pilot studies of ways to assign values to water itself, because rational allocation of water to one or more of a number of competing uses requires such data, and the need becomes greater as water grows scarcer and greater decisions hang on the availability of such estimates. Agencies now having some expert abilities in obtaining of physical and value data are listed.

*Fish and wildlife.*—Because most fish and wildlife are not made subject to private ownership or management, they have no market values. In important cases this no-charge policy results in the devotion of excessive amounts of labor and capital to fishing, as free enterprise responds to high prices and low costs.<sup>3</sup> It is suggested that rational allocation of scarce factors of production would be aided by collection and estimation of data showing the *necessary*, as well as the actual, fishing vessels, equipment, and men devoted to taking the existing levels of catch. The capitalized value of the excess of the actual over the necessary inputs would provide an estimate of the value of the fish resource itself, and would aid in designing measures of taxation or control to rationalize the industries.

Without such estimates of wasted capacity, the only portions of the resource that can be given a market value are those subject to private ownership, such as certain oyster beds, fishponds, and private game reserves. The chief capital to be enumerated would be the equipment used in fishing, including excess as well as necessary vessels and gear.

*Public lands.*—The public lands are a large group of assets for which value data are inadequate because of the lack of transactions. Many of these lands have been held since the beginning of the Republic, and have never entered a market transaction. Others were bought so long ago that the price is irrelevant to today's values. Values of public properties transferred to private owners are frequently set by such special legal formulas as to have little relationship to market value.

For these reasons it is proposed to set up appraisal boards in each State or area to make estimates of values in view of all the circumstances and conditions applying to each parcel and kind of public land. Standards and procedures for determining these values would of course need to be established by, and supervision supplied from, a central office, to insure comparability among estimates.

It is recommended also that the values estimated by these boards be those for land alone, not including the timber or mineral values on or under the land. These values should be covered by the methods of the mineral and timber inventories.

<sup>3</sup>This is only one of many instances throughout the economy in which excessive inputs are applied, causing significant wastes. Probably most are due to some form of monopolistic competition; some are due to "external diseconomies," in which real costs of production are not paid by the producers, but are put upon others, like the noxious effluents of mines or chemical plants, or the noise and dirt of highway traffic. Because of the prevalence of excess inputs, there are substantial doubts related to whether estimating their extent in commercial fishing would involve the wealth inventory in problems of too broad a scope.

## IV. EXISTING DATA ON NATURAL RESOURCES AND THEIR VALUES

Existing published data on values or quantities of natural resources, and data which are believed to be useful in estimating such values and quantities are summarized here. The subgroup reports, which follow this concluding section of the group's report, deal mainly with problems of, and recommendations for, strengthening and expanding natural resource wealth data.

*Minerals.*—The chief source of direct data on wealth in the mining industry is the data tabulated by the Internal Revenue Service from balance sheets of business firms, principally corporations, submitted with their annual income tax returns and published as "Statistics of Income." Additional data, particularly the more complex cross tabulations and greater industry detail are available in the source book of worksheets available at the IRS in Washington.

Data are available by size-of-total-assets classes, by size-of-business-receipts classes, by size-of-income classes, by IRS district of principal office of business, and for eight subindustries (iron; copper, lead, zinc, gold, silver; other metals; bituminous coal; oil and gas; oil and gas services; stone, sand, and gravel; and other nonmetals (including anthracite)).

Balance sheet items given separately include cash, receivables, inventories, investments, depreciable assets, depreciation, depletable assets, depletion, land, intangible assets, and other assets. Liabilities are also given, with the following listed separately: Accounts payable, deposits, notes, other current liabilities, bonds, other liabilities, preferred stock, common stock, capital surplus, and earned surplus. Receipts and deductions are also itemized, although the great bulk are listed as "business receipts" and "cost of sales and operations." However, items of interest for a study of wealth include "rent paid on business property," "amortization," "depreciation," and "depletion."

The fact that these data are classified on a company basis rather than by establishments taken singly impairs their value for both industry and subindustry breakdowns, as well as for geographical distributions, which are based only on the district in which returns are filed, which generally means the State in which the principal office of business is located. Thus we note that for 1959-60 the "depletable assets" listed in the manufacturing industry, "Petroleum Refining and Related Industries" were 60 percent *larger* than those listed under the mining industry "Crude Petroleum and Natural Gas" and that the depletable assets listed under "Metal Mining" were a little smaller than those listed under the manufacturing "Primary Metal Industries."

No State (district of filing) data are published by industry, as the IRS regards such cross tabulations as of little value ("Statistics of Income, 1959-1960: Corporation Returns," p. 36).

A special survey of large corporations in 1960 provides a cross tabulation of depreciable assets devoted to activities in various industries, classified by industry in which each corporation was classified. This provides a biased sample of diversification, but does little to pro-



vide a basis for correcting the distribution of assets given in the regular "Statistics of Income" tables, not only because large corporations are not representative of all corporations, but because the industrial classification used in this table (pp. 18-20 of the "1959-60 Corporation Statistics of Income" was not the same as that employed in the tables covering all active corporations.

The aggregate values of depreciable assets of all corporations reported in "Statistics of Income," however, were found by Goldsmith to correspond fairly closely to his own estimates based on the perpetual inventory method (aggregating assets purchased or constructed, less estimated depreciation), though he notes that the agreement of aggregates might occur as a result of many offsetting differences.<sup>4</sup>

Whatever the value of the aggregate figures on depreciable assets, the data on depletable assets are probably much more dubious, not only because of the inherent difficulties in valuation, but because the depletion allowances taken by most mining companies ("percentage depletion") have no relation to the value of the assets; hence there is no motivation to give the IRS a true value. It seems likely that undervaluation is general in these data.<sup>5</sup>

The various censuses of mineral industries made by the Bureau of the Census (most recently published, 1958) since 1919 have provided no data on values of assets, but do provide figures which cover the universe on an establishment basis in various ways which may help in taking a census of wealth, or in making estimates based on a properly stratified sample. Among these are—

Value of shipments.

Value added in mining.

Products shipped, with quantities.

Number of employees.

Horsepower of equipment, separately for prime movers and electric motors, and in some cases by type of equipment and of motor used.

While assets on hand are not listed in the census tabulations, there are data on dollars of new capital expenditures made during the year, classified as "Development and Exploration," "Preparation Plants Constructed," "Other Construction," "New Machinery and Equipment," and "Used Plant and Equipment." A separate classification gives the value of "Purchased Machinery Installed During the Year." The crude petroleum and natural gas industry report gives a table on the number, footage, and cost of drilling and equipping oil and gas wells.

<sup>4</sup> Raymond W. Goldsmith, "The National Wealth of the United States in the Postwar Period" (Princeton University Press, 1962), pp. 83-86.

<sup>5</sup> For a notable effort in using "Statistics of Income" in combination with census data to estimate mining wealth by large industry classes, see Daniel Creamer, Sergei P. Dobrovolsky, and Israel Borenstein, "Capital in Manufacturing and Mining" (published by Princeton University Press for the National Bureau of Economic Research, 1960). These authors also present a more optimistic view of this data than that given here.

Most of the census data are tabulated by State and/or by producing district; by size of establishment; and by type of operation (strip, shaft, placer, with and without preparation plant, producing and non-producing, etc.). Many are also tabulated by number of employees; by output per man-hour; and by ratio of payroll to value added. In some cases there are data tabulated by county for principal producing areas.

The physical data on mineral reserves come from a number of independent sources, and are generally unassociated with value tags of any sort. Largest source of original estimates is the U.S. Geological Survey; the Bureau of Mines publishes these estimates (generally on a national basis, rather than for States or mining fields separately) in the annual "Minerals Yearbook" and the occasional volumes of "Mineral Facts and Problems."

Trade associations are another source of data: for petroleum, "proved" reserves are reported annually by the American Petroleum Institute; this was supplemented in 1961 by the National Petroleum Council's report on petroleum and natural gas reserves; it is supplemented biennially by estimates of secondary recovery possibilities by a committee of the Interstate Oil Compact Commission. For natural gas, annual estimates are published by the American Gas Association.

Thus it appears that for mining as a whole, and for the various subindustries, there are no data on wealth which are sufficient for analyzing investment, productivity, or economic development problems, though there are a number of landmarks which establish orders of magnitude and provide guidance for sampling stratification and physical volumes requiring unit value data.

Some of the existing figures from the "1958 Census of Mineral Industries" and the "1959-60 Statistics of Income" (corporations only) are transcribed below. The figures are uncoordinated; they are simply offered as a handy reference to systems of tabulation now used, and to the relative importance of the subindustries. The serious deficiencies of the "Statistics of Income" data were noted above. It is well also to remember that the same difficulty besets the census data in lesser degree: some data on manufacturing operations are included, where the particular establishments were engaged principally in mining operations; some data on mining operations are omitted, where the establishments tabulated were engaged primarily in manufacturing. However, a number of separate tabulations were made which make possible the separation of some data for the two aspects of such mixed establishments.

[Dollar amounts in millions]

Industry	Mineral industries (census 1958)			Mining capital assets (corporation tax returns, 1959-60)	
	Value added	Persons engaged (000)	Capital expendi- tures	Depre- ciable	Deplet- able
All mineral operations.....	\$13,681	790.4	<sup>1</sup> \$2,800.0		
All mineral industry establishments.....	13,381	769.5	2,798.0	\$11,920	\$3,739
Metals.....	1,187	94.3	214.0	<sup>2</sup> 5,804	<sup>2</sup> 1,614
				<sup>2</sup> 2,682	<sup>2</sup> 967
				<sup>2</sup> 1,211	<sup>2</sup> 377
Iron.....	500	31.7	43.0		
Copper.....	266	27.7	45.0		
Lead.....	48	7.1	4.5		
Zinc.....	26	4.4	4.1		
Gold and silver.....	38	4.3	5.2		
Bauxite.....	15	.7	1.4		
Manganese.....	20	2.3	2.2		
Tungsten.....	8	.7	.1		
Other ferroalloys.....	46	2.8	4.2		
Mercury.....	7	.7	.9		
Titanium.....	13	1.0	2.5		
Uranium-radium-vanadium.....	175	8.4	102.0		
Not elsewhere classified.....	2	.3	.7		
Services.....	23	2.3	1.3		
Anthracite.....	164	24.7	17.0		
Bituminous coal and lignite.....	1,610	195.0	188.0	1,820	410
				<sup>2</sup> 884	<sup>2</sup> 167
Oil and gas.....	9,035	333.2	2,190.0	<sup>2</sup> 5,650	<sup>2</sup> 1,174
				<sup>2</sup> 2,868	<sup>2</sup> 1,012
Petroleum.....	6,823	177.1	1,707.0		
Natural gas.....	517	17.2	236.0		
Natural gas liquids.....	588	16.6	95.0		
Services.....	1,108	122.3	151.0		
Nonfuel nonmetals:					
All operations.....	1,684	143.1	<sup>1</sup> 192.0	1,768	189
All mineral industry establishments.....	1,384	122.2	189.0	<sup>2</sup> 841	<sup>2</sup> 59
Establishments included in manufac- turing industries.....	299	20.9	<sup>2</sup> 2.5		
Stone, dimension:					
Included in mineral industries.....	13	2.6	1.2		
Included in manufacturing indus- tries.....	54	9.9	2.5		
Stone, crushed:					
Included in mineral industries.....	446	42.7	69.0		
Included in manufacturing in- dustry.....	117	5.0	( <sup>4</sup> )		
Sand and gravel.....	434	40.0	57.0		
Included in manufacturing in- dustry.....	63	2.5	( <sup>4</sup> )		
Clay and related minerals.....	129	11.6	13.0		
Chemicals and fertilizer.....	335	20.7	39.0		
Potash, soda, borate minerals.....	111	6.7	11.0		
Phosphate.....	64	5.4	5.7		
Sulfur.....	94	3.7	16.0		
Other.....	66	4.9	5.7		
Services.....	6	1.2	.8		
Miscellaneous (gypsum, talc, peat, etc.).....	86	6.9	9.3		

<sup>1</sup> This figure includes, from among operations classified as "manufacturing," only dimension-stone quarries with dressing plants.

<sup>2</sup> Accumulated depreciation or depletion against assets in preceding line.

<sup>3</sup> Represents dimension-stone quarries with dressing plants only.

<sup>4</sup> Not available.

*Timber resources*

The corresponding industry in the standard industrial classification is "forestry," which includes only planting, growing, holding, and caring for trees, plus gathering of gums, bark, and miscellaneous materials like nuts and balsam needles.

Logging and sawmills, pulpmills, etc. are included in manufacturing.

There are few data covering the values in this field. However, the forest surveys, complete for 23 States and partial for others, provided a basis for good quantitative estimates of the timberlands and stands in the United States as of 1952; 1952 data were reported in the U.S. Forest Service's "Timber Resources for America's Future," published in 1958. These estimates were given by State and region and by principal species of trees. Estimates were also provided on sizes of trees; certain quality classes; rates of growth; cut, fire, and disease losses; uses of timber cut; ownership of lands; etc. Breakdowns were given for commercial and noncommercial stands, and private and public ownership.

A separate appendix in this book rated the "Adequacy of Data." In it the authors indicated that the figures were good enough for national and regional analyses, and for some but not all State comparisons.

A similar comprehensive tabulation of forest survey data, for the year 1962, is scheduled for publication in 1964.

Limited valuation efforts have been made from time to time, as for example the national forest public domain values submitted to the House Government Operations (Dawson) Committee, and the tentative estimates adding up to \$8 billion prepared for the National Bureau of Economic Research in 1947. The latter may be found on page 233 of "Studies in Income and Wealth," volume 12 (1950).

Some possibly helpful data are contained in the census of manufactures (industry 2421) including cost (but not quantity) of stumpage cut, value and quantity of logs and bolts bought (and sold), and value and quantity of pulpwod sold.

*Water*

There are no adequate wealth data in the field of water resources or water facilities, though expenditures on new construction are given for Federal facilities in the annual budget, and for State, local, and Federal facilities in the Census Bureau's annual "Government Finances."

There is a considerable quantity of data available on the physical aspects of water resources. The most extensive sources on water supply are the "Water Supply Papers" of the U.S. Geological Survey, of which over 1,800 have been published. Summary reports on streamflow through 1950 are contained in papers 1301 through 1319; each volume covers a major river basin. Summary reports covering 1951-60 are in process of publication. Other summary reports describe ground water levels and artesian pressures, and the chemical quality and sediment characteristics of streams. Most comprehensive is Water Supply Paper 1800, "The Role of Ground Water in the National Water Situation." Further information on sources is given in "Publications of the Geological Survey."

USGS circulars also describe water conditions in certain local areas. Maps and graphic descriptions, with brief accompanying texts, are

published in a series called "Hydrologic Atlases." Much information on streamflow and other water conditions can be obtained from State offices of the USGS.

Water quality information is published by the U.S. Public Health Service in "National Water Quality Network: Annual Compilation of Data." A biennial report, "Municipal Water Facilities Inventory," is published for communities with a population over 25,000. Data for communities down to a population of 100 are published at 5-year intervals. The Public Health Service also publishes data on waste treatment facilities, at 5-year intervals. Nine volumes have been issued, latest of which is "1962 Inventory of Municipal Waste Facilities" (Public Health Service Publication No. 1065).

A comprehensive survey entitled "Federal Water Resources Research Activities" was compiled by a task force of the Federal Council for Science and Technology and published in 1963 as a committee print of the Senate Committee on Interior and Insular Affairs.

A number of significant studies were prepared by the staff of the Senate Select Committee on National Water Resources, and published in 1959-60.

The U.S. Army Corps of Engineers and other public agencies are responsible for comprehensive river basin planning efforts which result in compilation and projection of water use and water quality statistics for certain river basins.

Many States collect data on their water resources, notably the more arid States, and particularly California. Several of the major cities and metropolitan areas have published data on local water supplies; New York and Los Angeles reports are most comprehensive.

Regional organizations, such as the Ohio River Valley Sanitation Commission (Orsanco) and the Interstate Commission on the Potomac (Incopot) publish data on their respective river basins.

Data on water use are relatively scarce but are increasing. The U.S. Geological Survey has published summary data for 1950, 1955, and 1960 in Circulars 115, 398, and 456. Other Federal agencies have tabulated certain uses of water in connection with censuses or regulatory functions.

### *Fisheries*

Fisheries industry definition (SIC) : This industry includes salt and fresh water catching of fish, whales, shellfish, sponges, etc., and fish hatcheries, fish farms, etc.

Independent dock establishments fall in the transportation industry, rather than in fisheries. Independent cleaning, etc., plants are in food manufacture.

As of January 1964, there were no data on the aggregate value of capital in fisheries. "The Statistics of Income" do not separate this industry from agriculture and forestry, and the Bureau of Commercial Fisheries' annual "Fishery Statistics" gives no value figures. The latter does, however, list vessels, boats, and gear in some detail by States and regions. Data are given for number of motor vessels and total tonnage, number of sailing vessels and tonnage, number of motorboats and of other boats, number and length of different types of nets, and number of traps, lines, spears, dredges, hooks, tongs, etc. The 1961 volume (pp. 80-101) gives age of all vessels 5 years old or older.

The Bureau of the Census is expected to secure in 1964 the first capital value data for the industry. Questionnaires will ask original cost of vessels and their age. The tabulations of these reports, by States, form of business organizations, etc., should provide a useful landmark, though depreciation charges and the value of boats and gear will not be available.

The available physical data should constitute a reasonably good basis for estimating current values if the current market prices of sample vessels, gear, etc. can be collected. Fairly active markets exist for used boats, vessels, and gear.

Estimates of the values of commercial fisheries that would exist if these fisheries were *rented* instead of being open on a free-for-all basis are available in a few cases (cited in footnote 3 of the subgroup report below).

The values attributable to sports fishing and hunting resources are currently derived from data on fees charged for private facilities, total sportsmen's expenditures, total participation estimates, and other related materials which constitute a basis for further studies which may yield national wealth estimates. The data are available in the Department of Interior's Bureau of Sports Fisheries and Wildlife.

#### *Public lands*

Private lands fall in the categories of consumers' capital and capital in the agriculture, real estate, forest, mining, manufacturing, transportation, and other industries. Public lands fall in the categories of Federal, State, or municipal governments; many of them present problems which are different from those presented by the capital associated with Government activities, and different also from those presented by land in private ownership. Thus they may be worth special consideration and a special report.

The largest in size and probably in value are the holdings of the Federal Government. The General Services Administration reported Federal holdings in the United States at 770 million acres as of June 30, 1963 ("Inventory Report on Real Property Owned by the United States Throughout the World"). Of this, 719 million acres was "public domain," held by the Government since acquisition through agreement with the Original Thirteen States, treaties with foreign countries, et cetera. Only 51 million acres had been purchased or otherwise acquired from private owners so that a dollar "cost" figure could be attached to it. The sum of these cost figures was \$3.5 billion; the present value of these lands is probably several times this. In addition, the estimated present value of the "public domain" is \$18 billion (U.S. Congress, House Government Operations Committee, "Federal Real and Personal Property Inventory Report," as of June 30, 1963, p. 319).

In addition, on the same date some 1.7 million acres were involved in Federal leases in the United States and some 0.1 million acres in leases outside the United States.

The method of acquisition, surface area, and using or holding agency is given by States in the annual "Public Land Statistics" published by the U.S. Department of Interior, Bureau of Land Management. This report also gives much information on the entry of mineral claims, homesteads, oil and gas leases, timber sales, grazing leases, and other disposition of Federal lands and their products.

In the State and municipal fields, Marion Clawson has compiled and adjusted data from the National Recreation Association on the number and acreage of State parks and municipal parks by city, for cities of 100,000 population and over. These are to be found in his "Statistics on Outdoor Recreation" (published by Resources for the Future, Inc.), in appendix tables 11, 12, 13, and 17. Capital expenditures on municipal and county parks are given by States and regions in reports of the National Recreation Association, published annually in the U.S. "Statistical Abstract." Capital expenditures on State parks are given in the National Park Service's "State Park Statistics" (also given in U.S. "Statistical Abstract").

#### V. MINERALS SUBGROUP REPORT

This memorandum is intended to reflect the consensus on the measurement of mineral wealth which has been reached in the meetings of the minerals subgroup. The consensus is limited, but since we are not concerned to present an appearance of unity, divergent or supplemental ideas are freely included, with any isolated position labelled as such.

Although it is a mistake to insist that all potential uses be foreseen clearly before initiating a new program of data collection, some uses of wealth data for the mineral industries can be foreseen. Wealth data for these industries are necessary for the handling of all questions involving the quantity of capital in use in these industries, in regions, or in all industries. John Kendrick's work on productivity and Edward Denison's work on economic growth come readily to mind as examples. Clearly a wealth inventory will improve the income accounts series and their interpretation.

There are uses of such data that are more narrowly applicable to the mineral industries, however. These center around the problems of search and exploration. In some of the mineral industries—and to some degree in all—we know very little in a statistical way about the relations between outlays directed to these ends and the results therefrom. A wealth inventory, together with data on certain outlays between inventory dates, could contribute to further progress on such questions.

A minerals wealth inventory inevitably will reveal mineral deposits in many areas which are known or are thought to be rich deposits in the physical sense but which in fact have very little value. Many people persist in associating economic value with physical richness, and as a result sometimes come to espouse positions on various questions of public policy which are economically indefensible. The effects of bringing into the open the facts on economic value of mineral deposits can be only salutary, for this will stimulate inquiry into the reasons for these values.

Wealth estimates are difficult to make at best, but they are especially so for the mineral industries because the physical description of the asset in question is far less definite than is the case with assets that are entirely visible, such as agricultural or site land or depreciables. We are not sure that a good inventory of the wealth of the mineral industries can be made. It is altogether likely that estimates will turn out to be wide of the mark or that some procedures may be too expensive to be used on any but a very small scale. Therefore, the sug-

gestions made here are very tentative. Initial efforts to produce a wealth inventory for these industries should avoid a large commitment to a particular method. Instead, the problem of valuation should be approached in different ways to obtain that weak check on accuracy—consistency of results obtained by different methods.

*Scope of mineral industries wealth estimate*

In the case of petroleum, the bulk of the wealth is in proved reserves of oil and gas and should include on-lease production facilities. Mineral rights on undeveloped oil and gas lands under lease should be included and probably can be with a fair degree of success. Unleased mineral rights ought to be included where it is reasonably clear they have a market value, but it may be difficult to do so.

In the case of the other mineral industries, all mineral rights which have a market value ought to be included in principle but initial efforts obviously should be concentrated on operating mineral properties and on idle but developed properties. These categories contain the bulk of the market value of the properties. It may prove possible to include undeveloped properties for a few special cases and locations.

In the case of operating establishments, the "Standard Industrial Classification" definitions should be used to divide mining establishments from nonmining, following the usage of the census of mineral industries. This mode of definition will not only provide a suitable line of separation, but is especially appropriate in view of our later suggestion that consideration should be given to using the Bureau of the Census as the instrument for assembling some of the desired data.

We note in passing that geothermal energy sources should be included, although their market value at present is negligible.

*The general procedure envisaged*

We doubt that book value figures as of a given date are of much use to a wealth inventory for several reasons. The lack of correspondence between book values and market values is much more serious for the mineral industries than for others even in the absence of price level and technological change. The age distributions of the "items" in the capital stocks (or the lives of the "items") are but poorly known. Hence any corrections for price level changes would have to be rather speculative.

The following program for a wealth inventory may be feasible:

(1) A *market value estimate* of mineral industry properties would be prepared initially and thereafter at intervals of, say, 5 or 10 years.

In neither the petroleum nor the other mineral industries does it appear feasible to estimate the value of mineral resources separately from the value of the manmade capital that has been invested in them or is so intimately associated with them. It may be possible, however, to estimate separately the value of certain tangible categories of manmade capital. We have in mind especially mobile equipment, concentrating units, and so on. For these categories it should be feasible to collect comprehensive data on book value, which would be on an original cost basis. Data on detailed type of asset and year of acquisition could be developed by sampling rather than comprehensive collection, as probably would be done with capital in manufacturing.

However, these categories of tangible capital almost certainly could not be so extensive as to embrace all outlays on mine development,



and even if they did, the difference between the value of the mineral property as a whole and the value of these categories (which presumably would be derived from a cost basis unless they are movable) would be only a difference and should not be taken as a measure of the value of the natural resource "per se." The value of a natural resource associated with a going mine is something different from the value of the same natural resource before development has taken place.

This problem suffers from still another complication, in that the existence of many deposits would not even be known were it not for earlier capital outlays directed to the uncovering of their existence. We should expect some tendency—how strong may be conjectural—for these outlays to be reflected in the value of producing properties.

One possibility for valuing the wealth of the mineral industries is to use stock market values. This method might be feasible if most companies had only domestic operations, if they confined their operations to "Standard Industrial Classification" categories, and if their stocks were active. Since these conditions are not present, the method has been rejected. Even if these conditions were met, there would still be difficulty in separating property beyond the mineral stage and in allocating property to regions or States.

(2) As a means of periodic adjustments to the benchmark market value appraisals, annual estimates of *capital outlays* and *capital depreciation and depletion* would be prepared. For the tangible capital categories for which separate sample data on age, et cetera, could be developed, depreciation estimates would be an easily derived by-product.

(3) It would be found that the initial market value plus net capital outlays in, say, the next 5 years would not be equal to the market value estimates 5 years from now. An important part of the exercise would be to try to account for this difference, which would be ascribable to such factors as investment mistakes and windfalls (including changes in prospects for the commodity and discoveries made cheaply), errors in capital consumption charges, error in the initial level of market value relative to the later one, price level change, change in value from holding for later exploitation, and technological change.

#### *Estimating market value of petroleum properties*

The main reliance for doing the first of these three steps, the market value estimate, can and probably should be different for petroleum and the other mineral industries. The market for petroleum properties is more active than it is for other mineral properties and hence is more reliable as a generator of prices for these properties. While there are difficulties in evaluating the "price" of some of the larger transactions in petroleum properties, both because of many factors affecting the value of a purchase which do not get expressed in a simple price and because of the different kinds of properties included in the aggregate consideration, the problem of valuation is far easier than for non-petroleum properties.

There are two general approaches to the valuation problem that could be used. The first would begin by examining known large market transactions in petroleum properties. Possible sources of information on transactions would be the producing companies, banking institutions that specialize in the financing of petroleum land transac-

tions, and occasional published information. The payments in these transactions would be expressed as payment per barrel or per cubic foot of proved reserves. These values would then be applied to "similar" proved reserves in the same or possibly in other producing areas.

The above method would not automatically produce a good estimate. The difficulties are very real. First is the question of the representativeness of the transactions, a difficulty suggested above by the use of quotation marks around "similar" when applied to other proved reserves. Second is the difficulty of putting the "proved reserve" data from the known transactions on the same basis as the comprehensive reserve estimates (e.g., the API estimates) which would be the means for deriving the value totals for most of the industry.

The handling of other petroleum lands would depend on the amount of time and money that could be devoted to them. There are numerous transactions in them, and prices can be found for local areas. Estimates of acreage under lease, which may be useful in spite of sizable differences, are made, e.g., by the IPAA and are also available from the Scouts' "Yearbook."

One possibility that should be investigated is to use the mineral census machinery to collect information on transactions prices for mineral rights, both for the transactions in lands with proved reserves (producing and nonproducing) and for the potential petroleum lands, although the canvass would have to be limited to properties purchased by establishments in the petroleum industry under present census procedures.

The mineral rights on land not under lease may have a positive value and in some cases may be high. It might prove possible to include some of these lands, depending on how much information is developed on prices of mineral rights, but the relative error caused by omission of potential unleased petroleum lands from the total value of petroleum lands would be small.

In an area where the total inventory of leased acreage is constant, the average year's outlay on bonuses, rentals, and royalties could form the basis for an estimate of the mineral rights.

Another general avenue of approach, which can be used to supplement and check the first, is to value proved reserves by applying field prices to an estimated schedule of production from proved reserves, then work back to the net annual income of the properties by applying appropriate expense ratios derived from census and other data, and finally to reduce these annual values to a present capital sum. This method has been tried in a preliminary study by an associate of one of the committee members and yields plausible results.

Each of these methods can yield estimates of wealth with sufficient geographical detail for purposes of the wealth inventory.

#### *Market value estimates for nonpetroleum minerals*

Transactions in nonpetroleum mineral properties are so infrequent that to rely mainly on transactions prices, as was suggested for petroleum lands, does not seem to be feasible. The goal is to obtain an estimate of the market value of mineral properties, just as with petroleum properties, but the method for doing so must be different.

If prices of properties cannot be had from market transactions, there seem to be only two ways to estimate value of these mineral properties.

One is to ask those who know something about the property in question what they think it might sell for in a voluntary sale (voluntary as opposed to forced). The other method is the same as the second one suggested for petroleum—to work from mine value of product back to a net profit or net royalty for the mine, finally reducing this to a present value capital sum.

The first method would involve direct interviews with company officials, property owners, State tax officials, or any other persons in a position to have detailed knowledge of properties. They would be asked to estimate the price at which the mine in question and the accompanying mineral lands could be sold. Since the formation of such an estimate would require consideration of the mine's reserve status, this would be a convenient point at which to collect such information. There may be possibilities here for fruitful collaboration among the Bureau of the Census, the U.S. Geological Survey, and the U.S. Bureau of Mines.

The unit for which such an estimate of market value would be made would be the mine, which would be substantially the same as the census mineral establishment. Careful attention would have to be paid to the scope of the value estimate. Adjustment probably would be necessary to make it conform to the scope of the data on capital outlays collected by the census.

Estimates for nonoperating properties should be kept separate from those for operating properties, of course. The latter estimates would be more reliable.

We wish to emphasize the great difficulty that is present in any attempt to appraise the value of mineral properties. Property owners are notoriously unreliable sources of information about the value of their own property, even in properties such as houses in which transactions frequently occur. Where transactions are infrequent, the property owner has even less information upon which to base an estimated value, and in such cases the estimate probably would be considerably less reliable. In any case, it would be desirable that the value of the particular properties selected for evaluation be estimated by different people and by different methods so as to obtain something of a check on the results. It may be possible, at least for some of the particular properties investigated, to work back from mine value of ore or concentrate to a net "profit" per unit of product. This figure, together with information on reserves of the particular properties investigated, could be made to yield a present value capital sum to be compared with values estimated by those who are able to appraise the value of the property directly, perhaps on the basis of their familiarity with transactions or offers for similar properties in the area.

Direct investigation of property values and related quantities would have to be on a sample basis, although it may be possible to produce complete coverage estimates for particular areas where such estimates or similar estimates have been made for other purposes.

The problem of blowing up the sample data to universe size would have to be studied carefully. One possibility is to use already assembled reserve data as the vehicle, assuming that comparable reserve data can be had for the properties that are studied intensively. Another possibility is to use annual production data which are available for each operating unit. The choice between these two methods

will depend on the variability among properties of the value per unit of reserves as compared with the variability of value per unit of annual product.

The expense of a large sampling operation could be avoided by making an *aggregate* estimate of the value of mineral properties in an industry in the same way as was described earlier for petroleum (i.e., the sum of discounted net revenues from an estimated time schedule of production of present reserves). It is the opinion of at least some members of the subgroup that the method is of doubtful feasibility for nonpetroleum minerals with the possible exception of coal. The difficulties involve two, and perhaps all three, of the factors required for the calculation of current net rents. Reserve estimates are probably less reliable for various reasons than for petroleum. Nor is it clear that a reliable average ratio of net rent to gross mine receipts can be derived from available data. Even if this ratio can be estimated, some way is needed to check whether reserve data and the ratio of net to gross in fact fit together or match each other in such a way as to yield a useful estimate of the value of the mineral properties. If these difficulties are important in fact, the conclusion seems to be that there would be sizable risk of large error if sole reliance were placed on an aggregative estimate of the type described.

If valuations are to be developed by an interview-appraisal procedure, it is not clear which of the existing agencies working in this field would be best fitted to handle the program but it should be borne in mind that the Geological Survey and the Bureau of Mines already conduct programs for the collection of reserve data and other types of information from mining establishments. A possibility to be considered is a test of the feasibility of expanding the coverage of these efforts to include valuations, reserve, and other related data for a sample of nonpetroleum properties as described earlier.

Earlier it was suggested that the Bureau of the Census might find it possible to collect data on actual transactions prices for petroleum properties purchased by establishments regularly canvassed for the census. The feasibility of the same procedure for nonpetroleum mineral industries should be considered.

### *Capital outlays*

The collection of data on capital outlays in these industries is already a part of the census operation. This program would need to be reexamined, however, to insure that the definitions of "capital outlays" will yield data that can be related to the estimate of the market value of mineral properties. In particular, outlays on dry holes should be regarded—for wealth inventory purposes—as on the same footing as outlays resulting in productive wells.

Special estimates of annual depreciation and depletion would be necessary since accounting estimates of depreciation and depletion for financial reporting would not be consistent with periodic estimates of mineral wealth because of differences between book investment and market value. It is clear that the figures now developed for tax purposes would be of limited use.<sup>1</sup>

<sup>1</sup> One of the group's members suggests, however, that income tax forms could be a valuable source of information on certain types of expenditures if separate identifications of them were required. Similarly, information could be required on IRS forms which would permit an effective division between extractive and manufacturing activities.

In this connection, information on reserves could be of considerable value. It has already been suggested that it may be desirable to collect reserve information at the time when the attempt is being made to ascertain the value of particular properties. In the collection of reserve information on these and other occasions, however, it may be useful to give attention to the usability of this information for valuation purposes, both total value and annual charges.

We wish to emphasize once again the tentative nature of the suggestions that have been made. The feasibility of some of these suggestions is difficult to predict and can be determined only by a test, which might be of quite limited scope. Nor is there any single cost for a wealth data program for the mineral industries. This cost could vary from a few days of highly competent and skilled manpower using available data and heroic assumptions to a painstaking on-the-spot investigation of a sample of properties large enough to yield considerable geographical detail. We are not in a position to suggest what level would be best, for that would depend on the annual amount of money available and the costs of preparing estimates for other sectors.

#### SUPPLEMENTAL STATEMENT BY MILTON LIPTON

I feel that in any inventory of wealth, and particularly for minerals industries, a clear distinction should be made between the cost of reproducible assets and the market value of all assets including natural resources.

The former has to do with outlays required to find and develop subsequent production and to generate future income from production. Whether measured by depreciated original cost or replacement cost, an inventory of wealth so defined would be a meaningful measure of capital inputs that could be related to "the results therefrom." (I would note that the potential uses identified in the introduction to the minerals subgroup report apparently without exception involve this perspective on wealth data.)

An inventory of wealth based on market value of assets would necessarily encompass both reproducible assets and natural resources since in most instances installations have no real market value apart from their immediate use in resource development. It will be recognized, of course, that market valuations subsume a wide range of considerations, including *expected* future prices, production rates, and capital costs. And there may be many reasons periodically to attempt to assess market valuations, as a reflection of such expectations by the market place. I question, however, whether the data would be available accurately to estimate market valuations for minerals industries—and I feel that the inevitable imputations from limited and scattered evidence would not really provide a reasonably useful approximation to market valuations. Perhaps the effort should be made; but the conceptual and analytical distinction between the two approaches—cost and value—should be recognized.

At the risk of unnecessary repetition, I would stress that the approach to an inventory of wealth via capital outlays and depreciation provides an input/cost perspective on investment in minerals industries. The approach via market valuation provides an output/income perspective. Each may have its uses—and the ratio between the two

could be of considerable interest. But they are quite different perspectives on wealth—and the differences warrant much more attention than is briefly set down in the report, e.g., paragraph 3, page 565.

## VI. TIMBER RESOURCES SUBGROUP REPORT

### *Definition of the resource*

For a wealth inventory, the forest land resource must be distinguished from other natural resources. The definitions used by the U.S. Forest Service in its nationwide forest inventory are those on which the available physical data are based and should be followed in the wealth inventory.

Forest land is "land at least 10 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for nonforest use."

Three broad classes of forest land are recognized which differ significantly in their characteristics as wealth. These are:

Commercial forest land—"land which is producing or is capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation."

Productive reserved forest land—"productive public forest land withdrawn from timber utilization through statute or administrative regulation."

Unproductive forest land—"land incapable of yielding crops of industrial wood because of adverse site conditions."

### *Scope of this report*

Only the commercial forest land has value for the production of timber. But all of the classes of forest land may have value for one or more of the following ends: water, recreation, wildlife, grazing by domestic livestock, and esthetics. On the commercial forest land, these other values—where they exist—are in addition to the timber value.

Timber values are concrete and can be estimated with reasonable accuracy. Grazing values are also concrete but are closely tied to the value for the same use of nonforest pasture and range lands, and are best estimated in conjunction with the valuation of those lands. The other values are intangible or very difficult to quantify. They definitely exist, but do not generally have a market price and at present we do not know how to estimate them.

This report will be limited to the determination of the timber resource wealth. It will point out the existence of the other forest resource values but will not give recommendations for their estimation.

### *Reasons for making an estimate of timber resource wealth*

Representing one-fourth of the Nation's land area and providing the raw material base for timber-connected activities accounting for some 5 percent of national income, our commercial forest land and timber resource forms an essential component of any national wealth estimates.

Within the forest economy itself, timber wealth estimates provide a guide for determining the economically justified scale for forest protection, development and research programs in both the public and private sectors. In addition such estimates throw light on the im-

portance of timber resources in the tax base of local government and facilitate the development of forest credit and insurance facilities through improved knowledge of resource values. Periodic extensions of benchmark estimates throw light on the changing structure of the forest economy and aid in regional planning and development.

*The data needed for a wealth inventory*

*Forest land area.*—The area of all forest land should be determined and classified as to whether it is commercial, productive-reserved, or unproductive. The areas of the productive-reserved and unproductive forest lands should be shown in the wealth inventory regardless of whether values can be assigned to such lands or not. As economic, social, and political conditions change with passing time, some lands will change from one classification to another. They should be classified as of the 1970 wealth inventory target year and then reclassified as necessary for succeeding inventories.

*Commercial forest land area.*—This should be classified according to site quality, area condition, stocking, forest type, and accessibility.

*Timber of commercial size.*—The volume of this timber should be determined on all commercial forest land. It should be measured in volume units suitable for the various possible products. It should be classified according to suitability for sawlog or other products, major species, diameter class, log grade, and volume per acre.

The productive-reserved forest lands also contain some timber volumes of commercial size. The value of this timber cannot be included in the wealth inventory because it is reserved from cutting. However, a physical inventory of the timber on these productive-reserved lands would be useful for various purposes and should be included in the wealth inventory.

*Forest growing stock.*—This consists of all live trees with the exception of those which for any reason are not producing usable wood. The volume of this growing stock should be determined on all commercial forest land. It should be classified according to forest type, species, stand size, and stocking.

*Annual timber yield.*—This is the total volume of timber produced during the year. In order to determine it, information is needed on the net annual growth of timber (the annual change in net volume of live trees resulting from natural causes) and the annual volume of timber cut. The difference between the net annual growth and the volume of timber cut represents an addition to or subtraction from the standing timber inventory.

*Ownership.*—All of the above data should be classified by broad ownership classes.

*Regional detail.*—Timber resource data should be available for geographical areas smaller than States, if it is to be most useful. The data should be on a county basis with provision for combining groups of counties in order to reduce sampling error for some items.

*Stumpage prices.*—These are the prices paid for standing timber of commercial size before it has been cut. They must be in sufficient detail to recognize differences in the products for which the timber is suitable, species, diameter class, log grade, volume per acre, physical accessibility, logging and transportation costs, and the markets available for the products removed.

*Timberland prices.*—These are the prices paid for land and timber together when forest properties are sold. They must be in sufficient detail to recognize differences in site quality, forest type, growing stock volume, accessibility, and geographic location with respect to markets for timber.

#### *Existing data*

The U.S. Forest Service conducts a nationwide forest inventory on a continuous basis. Individual States have been remeasured at about 10-year intervals. The Forest Service periodically makes the necessary adjustments to bring the inventory up to a common year for the entire country. This is now being done for the year 1962 and publication is anticipated in 1964.

This nationwide forest survey is now collecting most of the physical data specified above for a wealth inventory. Up to now, it has not classified this data as to accessibility of the forest land. The survey also has not inventoried the timber of commercial size on the productive-reserved forest lands. The forest survey is made in sufficient regional detail to satisfy the needs of a wealth inventory.

Much less information is available on prices. The census of agriculture includes the value of forest products sold for farm woodlands only. The census of manufactures includes the cost of stumpage cut, the quantity and value of products shipped, and the value added for lumber and other wood products.

The stumpage prices received on national forest timber sales are compiled and published regularly. Similar prices are available from other public forest agencies. A few States now attempt to collect and publish prices for private timber sales. A nationwide stumpage price reporting service has been proposed but has not yet been brought into being.

Prices paid for timberland are not being compiled or published by anyone at the present time.

#### *The problem of valuation*

The most serious difficulty in preparing an inventory of timber resource wealth will lie in assigning values to the physical assets.

Cost or book value does not appear to be useful for this inventory. Such book values do not exist for most of the publicly owned timber resources and these make up one-fourth of the commercial forest land area and 40 percent of the timber volume. The book values in the records of private owners are often the 1913 values required for income tax purposes or are otherwise badly out of line with present values.

There appear to be two other possible approaches. The following discussion will try to make clear the characteristics and weaknesses of these approaches.

The first approach is to apply current market prices to the existing physical inventory. This physical inventory consists of two different kinds of assets. One is a stock of commercial-size timber which can be sold to processors for conversion into wood products. The other is a timber-growing machine consisting of land and growing stock and capable of producing wood each year on a continuous basis.

The price which people pay in the market for units of the timber-growing machine (tracts of timberland) presumably is based on the



income which they expect to get from their investment by growing wood. It seems reasonable, therefore, that the value of all of such timberland in the country should be equal to the total number of acres of that land multiplied by the average price per acre being paid for such land in the current market.

The stock of commercial size timber is of a different nature, however. People buy such timber in the current market with the intention of logging it within a short time and selling the products they can get from it to the consumers of those products. This consumer market will absorb only a limited amount of these products during a year. The purchasers of stumpage on the average buy during 1 year only the amount they need to produce the quantity of products that the consumers will buy. If they buy more than this amount, they will have to hold it for use during a future year with the consequent cost of interest on the capital they have invested. It appears, therefore, that all of the existing stock of commercial size timber cannot be assigned the value per unit that such timber is selling for in the current market. The portion of the existing stock which exceeds the amount that can be converted into consumer products and sold during this year must have a lower value than the current market price.<sup>1</sup>

In trying to decide what price is legitimate for this excess existing stock, a further complication arises.

If the forest growing stock is properly regulated by size and age classes, a tract of timberland will produce a certain yield of wood that may be cut each year in perpetuity without changing the volume remaining in the growing stock or the size of the future annual yields. However, some more of the growing stock besides just those trees that should be removed as annual yield will always be large enough for use and could be sold at the present time. This merchantable portion of the growing stock can be valued as a part of the timber growing machine or as a product salable in the present market. But both of these values cannot legitimately be assigned to these same trees.

In regions of the country where mature virgin timber still exists, many forests contain a greater volume of growing stock than is needed to maintain a maximum sustained yield. This surplus timber can only be valued as product and not as part of the machine. Market prices for land with timber may well include the value of some of this kind of surplus growing stock. By contrast, if market prices for timber alone (stumpage) are applied to all of the merchantable timber on a tract, the result will not include the value of the submerchantable sized growing stock and the land. The market price approach will require a careful combination of the market prices of both stumpage and complete timberland properties in order to avoid either double counting or omission of part of the asset in the valuation.

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<sup>1</sup>This statement appears to be in contradiction to the principle that in a competitive market, goods of identical qualities cannot sell for different prices. In the present instance, buyers of timber in the "current" market would switch to buying in the "deferred cutting" market, if there were any distinction between the markets, and if timber in the latter market bore a discount. Differences in prices can result only from differences in quality of wood, uniformity of stand, accessibility, monopolistic influences among buyers and/or sellers, ignorance on the part of buyers or sellers, special conditions imposed on the cutter (such as cutting only designated trees, avoiding damage to undergrowth, replanting, or tie-in sale of unwanted stands with desired stands), etc. Holders of mature timber for future sale must expect a rise in price sufficient to cover the cost of holding (interest, taxes, insurance, protection, etc.), or they would be acting irrationally and uneconomically—Neal Potter, Secretary.

The second possible approach is to calculate a capital value for the timber resource on the basis of the net annual revenue expected from the resource. If the amount of timber cut annually from the forest is known, this can be valued at market prices in the region for such timber. The value (also at market prices) of the change in the standing timber inventory during the year must be added to or subtracted from the value of the annual cut (depending on whether the growing stock volume increased or decreased) to obtain the gross value of the total yield. From this gross value must be subtracted all of the costs of managing the timberland and retaining ownership during the year (except for interest on the investment in timberland). The resulting net value of the total yield is attributable to the timber resource. The value of that resource can be obtained by capitalizing this net annual revenue at an acceptable rate of interest.

Although this capitalization approach avoids many of the problems of the market value approach, it has its own share of difficulties. Reliable data on the current management costs either are not available or will be difficult to segregate from the other costs of administering organizations. A more serious problem is the rate of interest to be used in the capitalization. Part of this capitalization rate is an allowance for risk. In order for the timber wealth estimates to be comparable with those for other sectors of the economy, it will be necessary to estimate the relative riskiness of an investment in timber resources. Since a substantial segment of this resource is in public ownership, there is also a question of whether the same rate of interest is acceptable for both public and private investments.

#### *The problem of overlap*

The nationwide forest survey obtains information for all commercial forest land in the United States. A value based on this inventory will therefore be a complete figure for the timber wealth of the country. However, some of this same timberland will be picked up in other wealth inventories. The agriculture inventory will include the value of farm woodland. The public lands inventory may include the value of publicly owned timberlands. The real estate inventory may include timberland being held for future development for other purposes. The manufacturing sector inventory may include the value of timberlands owned by wood using and mining firms. It will be necessary in consolidating the total wealth inventory to eliminate these duplications. For this purpose, timberland values should be identified and shown separately in every sector inventory where they may exist.

One important natural resource in the United States is the range and pasture land used for the production of domestic livestock. A part of the rangeland is forest range and is included in the forest land area. Some of this forest range is commercial forest land and produces or is capable of producing timber as well as forage. The area of land grazed is known to the people who use it and should be available from the public land managing agencies and from the census of agriculture. Grazing values can be placed on this land and in the case of commercial timberland these will be in addition to the timber value.

Some of the existing forest land is potentially suitable for conversion to agricultural, residential, industrial, or other uses because of its quality or geographical location. The current market value of such land is often based on its probable future conversion to these other uses and in such cases is usually higher than its value for timber production. Since these lands are actually forested at present, they will be picked up in the timberland inventory. It does not appear that the total timber values involved are sufficient to justify much concern on account of the timber resource inventory. However, where they can be recognized, such lands should be picked up in the real estate inventory and excluded from timber values.

#### *Forest wealth compared to timber wealth*

The total value of the Nation's forest resources is a composite of their value for timber, recreation, grazing, water production, flood control, wildlife, protection from wind and adverse weather, and esthetic enjoyment. This is the value which really should be included in the national wealth inventory. However, with the exception of timber and grazing these are very difficult values to measure. The protection and esthetic values are almost entirely intangible. No satisfactory method has so far been developed for imputing back to the land resource its share of the value of the water and wildlife produced on it. More progress has been made on recreation but the valuation of land and forests for recreational use is still in a very primitive stage of development.

It seems best to place monetary values only on the timber- and forage-producing aspects of the forest resource. However, it is entirely possible that the Nation's forest resources actually have a greater real value for the other products and services they produce than they do for timber and forage. In order that the relative importance of the forest resources not be understated in the total wealth inventory, we suggest that this inventory include a section which describes in qualitative terms these total forest values and points out the significance for national wealth of the extensive forest resources possessed by the United States.<sup>2</sup>

#### *Proposals for data collection*

We feel that to a large extent the basic physical data required for an inventory of forest resource wealth are being collected currently by the Forest Service in its nationwide forest inventory. The Forest Service has been constantly improving the techniques and coverage of this inventory, and we may anticipate further improvements in it.

Accessibility is a prime factor in the value of a forest. The separation of forests into accessible and not accessible would be very useful from a wealth viewpoint. The statistics produced by the nationwide forest inventory do not at present provide any such separation. We recommend that the Forest Service be requested to study the possibility of classifying commercial timberland in the forest survey on some basis of accessibility that will be usable for wealth inventory purposes.

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<sup>2</sup> It should also be noted that the restrictive conditions often imposed on the cutting of timber in municipal watersheds, conservation areas, etc., may make the timber worth less to the buyer than timber sold under ordinary commercial conditions, which impose few limitations on the freedom to use the most economical methods of harvesting. These differences will need to be borne in mind in applying prices in particular sales to other "comparable" timber stands.

The greatest difficulty in preparing an inventory of timber resource wealth will lie in placing values on the physical assets. Because of the complexity of this problem, it seems best that some one agency be given the responsibility for studying it, developing procedures for accomplishing it, and making the necessary arrangements to obtain the price data for that purpose. We recommend that the U.S. Forest Service be asked to assume this responsibility since it is already collecting the physical resource data for the whole country.

We believe that the most fruitful immediate approach would be for the Forest Service to undertake a series of pilot studies designed to cover the range of conditions that affect the value of timber and timberland. Such pilot studies might be made of the value of the timberland resources of individual counties or similar areas. In these pilot studies, the Forest Service should have the cooperation of other landowning agencies and the assistance of advisory boards made up of people with experience and knowledge in the evaluation of timberlands.

Although it should be the responsibility of the Forest Service to work out satisfactory techniques for valuing the forest resource, we have some suggestions as to how they might start. It appears that it will be desirable to separate the resource into two parts: (a) mature merchantable timber and (b) land and immature growing stock. Because of the double-counting possibilities mentioned earlier, these two values will have to be combined and not merely added together. The only reliable source of information on prices appears to be transaction evidence, from current sales. Such transaction information should be collected from all possible sources and compiled for areas in which conditions are reasonably similar. Since timberland sales are infrequent in some areas, it will probably be necessary to supplement this information with the estimates of knowledgeable local people.

As a check on the values obtained for timberlands from transaction evidence, it appears that it will be desirable to calculate values by capitalizing the value of the current annual timber yields. The same kind of a check on stumpage prices may be made by appraising stumpage value through a residual rent approach similar to that used on the national forest timber sales.

This approach starts with current market prices for the final products which could be manufactured from the timber; subtracts manufacturing, transportation, and logging costs typical of a local operator of average efficiency; and then subtracts an allowance for profit and risk sufficient to maintain an average operator in business in the long term. The residual is considered to be a fair value for the timber on the stump in the forest.

In carrying out these pilot studies, the Forest Service should have the overall guidance of the agency responsible for compiling the national wealth inventory in order that the methods used for valuing the timber resources will be consistent with those used in other sectors of the wealth inventory.

#### *Annual extensions of the benchmark estimates*

The timber resource inventories could be extended annually by using the information collected on the annual net growth and the annual timber cut. It would be best if the entire timber resource inventory

could be brought up to date at 5-year intervals instead of at 10-year intervals such as passed between 1952 and 1962. If careful estimates of net growth are prepared at 5-year intervals, they will be sufficiently accurate for annual adjustments during the succeeding 5-year period, perhaps with additional corrections in areas where new data become available. The timber cut figures could be adjusted annually to conform to the statistics obtained from other sources on the production and consumption of wood products. Such annual extensions would become less accurate with each succeeding year but should not be badly out of line by the time the whole inventory is revised in the 5th year.

## VII. WATER RESOURCES SUBGROUP REPORT

### PREFACE

#### *Subcommittee on Water Resources.*<sup>1</sup>

The Subcommittee on Water Resources recommends that a physical inventory of water supplies, including lakes, reservoirs, and ground water, be included in the national wealth inventory. Measures should cover quality as well as quantity. (See secs. II and III.)

Capital facilities pertaining to storage, delivery, intake, water treatment, waste treatment, hydroelectric power, navigation, irrigation, and so forth, should be inventoried (as to physical characteristics and value), and are included in this report (secs. IV and V), even though some of these items may be in the jurisdiction of other Wealth Inventory Planning Study groups. It is also recommended that some information bearing upon the value of water per se be collected (sec. VI), and that further study be given to ways of improving information of this character.

Data sources are suggested at various points in the report. Agencies now largely concerned with each type of data are listed in section VII of the outline.

NATHANIEL WOLLMAN.  
EUGENE W. WEBER.  
DOUGLAS R. WOODWARD.

### INTRODUCTION

Man's development and use of water resources is characterized by direct interdependencies between otherwise independent decision units (individual households, business enterprises, units of local government). As a consequence it is frequently possible for such units to escape certain costs of water uses, for example, when quality deteriorates. Similarly they often fail to obtain any payment for utilities which are provided other parties, for example, all downstream parties may benefit when a particular user regulates streamflow for his own purposes. Consequently, the market fails to perform its ordinary allocative function adequately with respect to water.

Furthermore, structures such as dams involve far-reaching economies of large scale. Because of hydrological interdependency between flow-regulating structures scale economies may extend to the planning and operation of basinwide systems of reservoirs.

<sup>1</sup> The subcommittee is deeply indebted to Allen V. Kneese for his invaluable assistance.

For these reasons, collective (government) action with respect to the development and use of water resources has long been recognized as essential. In this regard water differs at least in degree from other natural resource commodities.

This distinction has several implications for collection of data in general and particularly with respect to physical and economic wealth data.

1. Data collection must be planned and implemented with a view to its utility in planning for the *specific* allocation of the resource.

2. For reasons apparent from the above discussion, watersheds and river basins are significant water resource management units. Water resource data have little utility, even for projections as to its general availability, unless they relate to specific watersheds and basins. For many purposes, quality management is an example, they must be even more localized.

3. Detailed data on physical availability are particularly important in the case of water resources.

4. From a planning standpoint value data have their primary utility in aiding forecasts of demand and accordingly for estimation of the productivity of water in alternative uses. Unfortunately, the market provides comparatively few dependable guidelines. Even where water rights are exchanged, as in western priority doctrine States, subsidy and other legal institutional factors make the resulting values less than ideal. Nevertheless, systematic information on such transactions could have considerable utility and should be developed. In riparian doctrine areas, useful information can be obtained from data concerning the relative valuation of riparian and nonriparian lands especially if distinctions between types of water use and quality of water can be drawn.

The data on investment in facilities which is described in some detail in subsequent sections is of less utility for management purposes in specific basins and watersheds. These data will, however, be of considerable general interest and will be a significant element in the overall estimates of national and regional wealth.

#### I. GEOGRAPHIC DISTRIBUTION

A. Insofar as practicable all data should be tabulated by county. While it would be useful to have data tabulated for all counties the expense of doing so for many of the less important ones might not be warranted. It is suggested that detailed information be provided for perhaps 500 counties. The USPHS and the USGS should determine these counties on the basis of criteria such as importance as a source of water and importance of points of water use and waste disposal. These agencies should also investigate the practicality of recording specific points of streamflow measurement and major points of water intake and waste discharge on the basis of some form of coding system.

B. For purposes of additional data tabulation, the United States should be divided into major drainage divisions with appropriate subdivision, all boundaries to follow county lines. Basically the 22 regions used by the Senate Select Committee on National Water Re-

sources can be used. The following modifications should, however, be considered:

1. Rebound the lower Missouri to follow a watershed boundary.
  2. Divide the Western Gulf by a north-south line in the neighborhood of the 20-inch rainfall line.
  3. The lower Arkansas-White-Red Basin can be merged with the lower Mississippi, leaving 22 major regions. Alternatively the lower AWR, the lower Mississippi, and the eastern half of the Western Gulf can be combined into a single region.
  4. Each major region should be subdivided into appropriate subbasins, also along county lines. For example, the Colorado region might be divided as follows: Upper Main Stem, Green, San Juan, Little Colorado, Gila, Lower Main Stem.
  5. Counties should be grouped by State segments within subbasin or major region. This would facilitate combining counties into State totals.
- C. All relevant counties should be coded by subbasin, major region and, of course, State. Where appropriate, data should be aggregated by State segment of subbasin, by State, by subbasin, and by major resource region.

## II. PHYSICAL INVENTORY: QUANTITY

### A. Surface waters:

1. Streams, at specified points of discharge:
  - (a) Flow equal to or more than designated quantities 95, 90, 80, 70, and 50 percent of the time.
  - (b) Mean flow.
  - (c) The following special computations should be considered:
    1. Reconstituted undepleted flows with their respective probabilities.
    2. Mean velocity.
    3. Mean length of reach.
    4. Mean depth at mean velocity.
2. Lakes (including reservoirs):
  - (a) Average, minimum, maximum volume, and durations.
  - (b) Surface area—as in (a).
  - (c) Depth—as in (a).
  - (d) Outlet control.
  - (e) Other data.
3. Reservoir sites\* (assume "full development"):
  - (a) Volume.
  - (b) Depth.
  - (c) Surface area.
  - (d) Physiographic characteristics.

### B. Ground water:

1. Estimated cumulative volume available at various depths.
2. Depth to water table.
3. Well capacities.
4. Rates of natural recharge.
5. Rates of depletion—drop of water table over last 5 years.
6. Transmissivity of aquifer. Artificial recharge capacity at least as a rank.

\*Identify in relation to specified points of flow control.

C. Water supply productivity of watersheds: Study of methods to determine runoff and ground water as a function of precipitation and wild evapotranspiration is needed.

NOTE.—Items under II fall within normal range of responsibility of USGS.

Item C may be best done through university research.

### III. PHYSICAL INVENTORY: QUALITY

A. Surface waters: Quality measurements interact with quantity measurements. It is important therefore to develop statistical summaries for relevant characteristics analogous to a flow-duration curve, e.g., values equalled or exceeded percentages of time.

1. Quality measurements as given in National Water Quality Network reports. County data will not be available from this source but it provides consistent measures at a number of points for a large number of parameters. These data as a minimum should be subjected to the statistical treatment indicated above.

2. Waste discharged into fresh water<sup>2</sup>—

(a) Into streams.

I. Level of treatment prior to discharge, by type of discharger.

II. BOD, by volume, by type of discharger (municipal, industrial, government agency).

III. Other pollutants by type of discharger, including nitrogen and phosphorus discharged from waste treatment plants and pollutants carried by surface runoff and drainage.

(b) Into lakes: I, II, III as in (a).

(c) Into coastal or estuarine waters: I, II, III as in (a).

B. Ground waters:

1. Identification of mineralized waters, degree of mineralization, volume, etc.

2. Identification of other types of pollution, amount of water affected, degree of pollution, type of discharger, as under III, A, 2.

NOTES.—Quality characteristics of ground water may be integrated with quantity measurements.

Items under III are dealt with by USGS and USPHS at the Federal level. Large amounts of data are, however, in the hands of municipalities and industries.

### IV. CAPITAL INVESTMENT IN WATER USE AND CONTROL FACILITIES

All capital values should be measured by original cost and by reproduction cost less depreciation. All value figures should be accompanied by relevant physical capacity data.

<sup>2</sup> Large amounts of data of this type are in the hands of individual industrial plants and municipalities. They have never been systematically collected and tabulated and it may be difficult to get many of them. One improvement urgently needed is better census of manufactures data. Presently the census does not even distinguish polluted process water from unpolluted cooling water. A committee should be convened to consider revision of the census data collection in view of current needs for information. This note also applies to IV F below.



- A. Dams and reservoirs (all purposes): Separate categories for all single-purpose dams. All multipurpose dams should be put together in a separate category.<sup>3</sup> Include dam, administrative facilities, land, access facilities, and costs of displacement and relocation of utilities, roads, communities, etc. (Number and major purpose or purposes of dams should be included.)
- B. Hydroelectric power installations except dams and reservoirs.
- C. Recreation facilities at dams and reservoirs.
1. Boat ramps, camping facilities, etc., public and private (exclusive of hotels, motels, etc., unless operated in direct connection with the reservoir).
- D. Water delivery systems:
1. Long-distance aqueducts, canals, pipelines, tunnels, siphons, diversion weirs, channel improvements, etc.
  2. Irrigation distribution facilities:
    - (a) Mains and laterals, pumps, etc.
    - (b) On the farm distribution and drainage.
- E. Flood control:
1. Channel improvements.
  2. Levees, floodwalls, floodways.
  3. Flood proofing of buildings.
  4. Shore protection works and hurricane barriers.
  5. Storm sewers.
- F. Pollution abatement:
1. Sanitary sewers.
  2. Household and community septic tanks.
  3. Waste treatment plants:
    - (a) Municipal.
    - (b) Industrial.
  4. Lagoons and ponds:
    - (a) For retention of wastes.
    - (b) For finishing of treatment.
  5. Barges and other facilities to dispose of solids.
    - (a) Should fertilizer plants be included?
  6. Effluent disposal facilities:
    - (a) Ground water recharge fields.
    - (b) Special outfall sewers.
    - (c) Other (some irrigation gets picked up here).
- G. Heat reduction facilities:
1. Cooling towers, spray ponds, etc.:
    - (a) Steam-electric power.
    - (b) Manufacturing.
- H. Drainage facilities:
1. Is this properly a value attached to land? Will it be picked up by group measuring land values?

<sup>3</sup>There was some question among the subgroup members as to whether there should be any recommendation calling for the allocation of joint costs of dams among the different uses which they serve.

- I. Local treatment and distribution facilities :
    - 1. Municipal :
      - (a) Water supply treatment.
      - (b) Distribution facilities—pumps, mains, laterals, etc.
      - (c) Local storage.
    - 2. Industrial.
      - (a) Water supply treatment.
      - (b) Local storage.
  - J. Fresh water navigation facilities :
    - 1. Docks, canals, locks, channel improvements.
  - K. Ground water facilities :
    - 1. Wells, pumps, windmills :
      - (a) Irrigation and other agricultural uses.
      - (b) Municipal.
      - (c) Industrial.
      - (d) Domestic.
    - 2. Well drilling facilities.
    - 3. Storage ponds and tanks, not elsewhere classified.
    - 4. Other related facilities—troughs, conveyances, etc.
    - 5. Ground water recharge facilities.
  - L. Coastal facilities :
    - 1. Navigation channels, seawalls, breakwaters, docking facilities, intercoastal waterways, navigation aids.
    - 2. Salt water intrusion control works :
      - (a) Surface water barriers.
      - (b) Ground water barriers.
- NOTE.—Responsibility for collection of data under IV is widely diffused.

#### V. CAPITAL INVESTMENTS IN WATER PRODUCTION AND RESEARCH FACILITIES

(Original cost and, where applicable, reproduction cost less depreciation.)

- A. Soil and moisture conservation :
    - 1. On the farm.
    - 2. On public domain.
    - 3. Silt detention dams.
    - 4. Channels to reduce evaporation and nonbeneficial consumption.
    - 5. Modifications of land cover to enhance water production.
    - 6. Evaporation suppression devices for lakes and reservoirs.
  - B. Desalination plants.
  - C. Water resource research facilities.
    - 1. Agricultural research leading to improved adaptation to limited water supplies.
    - 2. Water and waste water research.
    - 3. Engineering research.
    - 4. Hydrologic research.
- NOTE.—No systematic collection of data.

## VI. VALUE OF WATER PER SE

Because this section poses some rather formidable conceptual issues somewhat more detailed discussion of the various problems and possibilities is provided than in previous sections.

A. Value of water under appropriation law: In 17 Western States the "appropriation rights" doctrine prevails to one or another degree. In several States rights exchange independently of land. In the latter instances the market value of rights yields information concerning the discounted marginal value of water.

Even in these areas however it must be noted that markets are sometimes thin and that the taxing power is frequently used by public districts and other agencies to provide water to users below cost. Where this occurs the value of rights cannot be added to the value of dam and irrigation facilities without danger of some double counting. It would appear to be possible to reasonably adjust the data for this factor, however. Accordingly, a systematic effort should be made to collect data on the value of water rights.

In several Western States water rights are considered to adhere to parcels of land. In these instances the two are traded as a package and the transaction will reveal nothing concerning the separate value of either. In such cases the only possibility of obtaining an estimate of value of water per se would appear to be in comparisons of land value with water rights and the value of land otherwise equivalent but without water rights. The agencies responsible for collecting land value data should be encouraged to obtain information suitable for making such comparisons. Even in strict appropriation law States riparian owners without diversion rights will obtain some value from adjoining bodies of water. This may take the form of sport fishing, boating, swimming, or other recreation use or simply the esthetic amenity which propinquity with water offers.

Another important riparian benefit is low-cost waste disposal into the water course.<sup>4</sup> Again land value data should be collected in a form which permits comparison of the value of riparian land without water rights and otherwise equivalent land. Accompanying this should be information concerning the character of the benefit which contiguous water confers—waste disposal, recreation by type, amenity, etc., and the character of the water body—lake or stream and ideally also volume, physiographic characteristics, quality, etc.

In at least nine Western States there are important elements of "riparian doctrine" in water laws. In these States security attaches to ownership of an appropriation right and information on the value placed upon such rights would be valuable. The comments above concerning the values not "captured" by the appropriation right hold with additional force in these States and riparian nonriparian land value comparisons will be especially important.

Values derived from comparisons of riparian and nonriparian land prices may involve some double counting if they incorporate capital values of water use and control facilities. This results if the use of water yielded by such facilities is subsidized. In this case an appro-

<sup>4</sup>Waste disposal and some other water uses impose external diseconomies. At any given time internal economies and external diseconomies might not be in optimum balance. There is presumably a set of restrictions on riparian rights, which would tend to result in maximum asset value of the resource. In an estimate of existing wealth we can accept the asset value which corresponds to a given set of rights and restrictions.

appropriate portion of reproduction less depreciation of such facilities should be subtracted from land value.

One other important utility yielded by water is not captured by appropriation rights under current interpretation of the law. This is the value of head and flow for hydropower generation. This aspect is discussed subsequently.

B. The value of water under riparian law: The "riparian doctrine" which does not confer rights to specific amounts of water but permits the riparian owner to use any amount of water so long as he leaves it "reasonably" unimpaired in quantity and quality holds in the Eastern States. Where this doctrine prevails, market transactions reflect the value of water use per se through the values of riparian real estate and much more indirectly through the transportation and access costs which nonriparian users incur.

The first of these—real estate values—which result largely from relatively inexpensive water supply and waste disposal and the value of navigation, recreation, and amenity, is at least in principle subject to census. It would be desirable to collect land value data in such a way as to permit comparisons between riparian and nonriparian lands with the former classified by use and character of the contiguous water body.

The second type of utility which the market reveals is payment for access by nonriparians—largely for recreation use.<sup>5</sup> This is an important element in the value of almost all large bodies of water. Research has shown that a consistent measure of demand can be derived from such data. Questionnaire methods may also be useful for getting at the evaluation of nonriparian users. These methods are still under development, however, and while the committee sees great value in and wishes to encourage research along these lines, it does not feel that a stage has been reached where appropriate data could be included in a census-type activity.

It should be noted of course that the comments made with respect to the possible incorporation of capital value of flow regulation facilities in riparian land prices under point A apply to point B as well.

C. The value of head and flow for hydro power: It has been noted that the full benefit accruing from recreation is not captured in land values although a major part of it probably is. The benefit least likely to be reflected in land values appears to be hydropower. The huge uncertainty involved in anticipating the timing and value of specific hydroelectric developments probably means that very little of the hydro potential is capitalized in advance. After development there is (in contrast to say, recreation or navigation value) no opportunity to do so if the potential is publicly developed.

For hydropower the value of the benefit stream minus associated operation, maintenance and replacement costs (in principle including internal opportunity cost such as reduced recreation value due to reservoir drawdown) is the asset value of existing installations. The benefit stream could be estimated for various regions by the alternate cost technique. Similar calculations could presumably be made for economically feasible but not yet developed installations by discounting

<sup>5</sup> The value of recreation as such either as reflected in land values or as deductible from willingness to pay for access does not appear in the national income accounts.

the overall cost and benefit streams if some timing of development is assumed. The committee believes it would be worthwhile to experiment with calculations of this kind utilizing data from Federal agency studies. If these prove feasible, results should be included in the wealth estimates.<sup>6</sup>

#### VII. DATA SOURCES

A. Possible assignment of responsibility for data collection and coordination. It is not meant to imply that the agency listed will always be the primary *source* of data.

1. Item I: Federal Interagency Committee and interested research institutions.

2. Item II: USGS.

3. Item III: USGS and PHS.

4. Item IV:

A. Federal construction agencies (Corps of Engineers, Bureau of Reclamation, Soil Conservation Service, Tennessee Valley Authority); other authorities and Federal-State agencies (e.g., Idaho Power and Light, etc.).

B. Federal Power Commission.

C. Federal and State agencies—maybe Bureau of Outdoor Recreation can do the job.

D. 1. Corps of Engineers, Bureau of Reclamation, and States; 2. Bureau of Reclamation and USDA.

E. Corps of Engineers, Bureau of Reclamation, Soil Conservation Service.

F. All except 3(b) USPHS: 3(b)—Bureau of the Census (censuses of manufacturing and mining)

G. USPHS.

H. USDA.

I. 1. USPHS; 2. Bureau of the Census (censuses of manufacturing and mining).

J. Corps of Engineers.

K. USDA.

L. Corps of Engineers.

5. Item V:

A. Soil Conservation Service.

B. Office of Saline Water.

C. USDA, PHS, SCS, Bureau of Reclamation, Corps of Engineers.

6. Item VI:

A, B. Land and water right sales and records are State and local. It will require specific research to supply this information. Normal recordkeeping will not reveal the requisite data. Perhaps a grant can be made to a university or research foundation.

C. Corps of Engineers, Bureau of Reclamation, and Fish and Wildlife Service; States; river basin authorities; Federal Power Commission.

<sup>6</sup> Again possible double counting may occur if subsidized electric power rates are capitalized into real property included in other parts of the wealth study. The committee believes this can be neglected for the time being.

B. Data for the physical inventory and for inventory of capital facilities are either already being acquired or capable of being acquired with relatively little additional difficulty by agencies engaged in census and inventory activities. Data on various measurements of the value of water per se are not likely to be available in such form as can be acquired by routine collection methods. Special research projects can, however, supply benchmark data on at least a sample basis from which estimates of the entire universe can be constructed.

## VIII. FISH AND WILDLIFE SUBGROUP REPORT

### ISSUES

The problems that must be solved to measure the national wealth in the commercial fisheries and in recreational fishing and hunting are as follows:

1. To markedly increase the amount, quality, and kinds of statistical data available.
2. To establish for purposes of estimating the national wealth meaningful and logically defensible values for the American commercial fisheries and for outdoor recreational activity dependent upon fish and wildlife resources.

Data are needed on values in the commercial fisheries to enable private investors and Government policymakers to better gage the importance, profitability, and efficiency of the industry, and to judge the wisdom of various proposals for regulating, aiding and taxing the industry.

An inventory of fish and wildlife populations is needed for the guidance of Federal and State administrators of fish and wildlife programs, for outdoor recreational planners, and for land and water use planners. The International Association of Game, Fish, and Conservation Commissioners at their September 1962 meeting expressed the need as follows: "A thorough knowledge of present and future fish and wildlife needs and potentials is necessary to adequately plan for and justify future fishing and hunting space."

The U.S. Fish and Wildlife Service and representatives of the association were asked to investigate possible sources of funds to "organize and conduct standardized State surveys which will result in a national survey of fish and wildlife resources, future needs and potentials." The resolution is interpreted by association officials to extend, not only to surveys of users of the resource, but also to an inventory of the resource itself in depth, with a view to determining its size and distribution. Projection of future demand and supply were also to be covered. The Fish and Wildlife Service has estimated minimum costs on the order of \$12 million assuming the complete cooperation of State fish and game agencies. There is no present source of funds.

### SUGGESTED SOLUTIONS

#### *A. The problem of adequate data*

(1) 1963 census data on commercial fisheries: A progressive step is being taken to improve the data available on the commercial fisheries. In 1964 the Bureau of Census will conduct a census of commercial fishing. One question on the reporting form (as presently drafted),

will solicit information on the capital investment in fishing vessels (including engines). It is planned to obtain the data on the basis of original investment value together with data on the age of the vessel, making it possible to calculate estimated depreciated book value. The information to be obtained for year 1963 will be broken down on a State basis. Also it will be available by ownership unit, i.e., individual, corporate, or other.

These data represent a benchmark for investment data on the commercial fisheries. This benchmark may become the basis for future censuses of fisheries and intercensus estimates by Federal Government statisticians.

(2) Sport fish and wildlife data: As indicated in 2, above, the data on sport fish and wildlife populations and utilization are inadequate. Estimates on the size and distribution of the various resources can be prepared, given sufficient funds and personnel for a coordinated national effort involving sample population surveys and habitat evaluations. This would require close cooperation with State fish and game agencies which generally exercise principal responsibility for resource management of resident species. Surveys of recreational participation in activities based on these resources are needed to establish the level of current utilization for many species.

National surveys of participation in sport fishing and hunting, including monetary expenditures, were made for 1955 and 1960. It is tentatively planned to update these studies in 1971 to cover the calendar year 1970.

#### *B. The valuation process*

The determination of the market value of any asset involves two basic estimation processes. It is necessary to estimate the revenue the asset will generate in the future, and the rate of discount appropriate to the particular asset.

The present value of the discounted future revenue provides a basis for determining the market value of the asset. The future returns estimated to be generated by the asset are net returns, i.e., gross revenue less expenses of using the asset (carrying on the business).

This set of calculations, simple in theory, is of course, very complex in practice. Where it is necessary to secure agreement on the calculations involved in valuing specific assets, as in property taxation or public utility regulation, the process may take years, and involve arbitrary assumptions and compromises. When it is possible, on the other hand, to find a reasonably competitive market, in which the prices are set by the calculations and competitive bidding of a number of buyers and sellers, the existing market price is taken as the best current evidence of true value.

In the case of fish and wildlife resources, however, markets for establishing the capital value of the resource in the wild state are rare. Most are available with a zero or nominal charge, though frequently with some restrictions on methods and quantity of capture. Under conditions of free access to the resource in the long run the theory of fisheries points out that the net economic yield will be driven to zero; i.e., the resource will not have any market value. Any value over and above the cost of capture will provide commercial fishermen with an excess profit or wage which, over the long run, will attract more participants to the industry or area, until the catch per man is worth

just enough to keep the labor and capital in the industry.<sup>1</sup> As long as present conditions of exploitation remain, the tendency will be for these resources to have no market value, except in the cases where private ownership or leases currently exist (as in fishponds, private hunting preserves, and leased oyster beds). If the wealth inventory is to be confined to coverage of market values, the only things to cover will be the vessels, boats, gear, docks, etc., plus a few privately owned or State-leased resources.

However, limiting the wealth inventory in this way will make impossible the use of the resulting data for the primary purpose for which economic data are gathered; viz, the rational organization of production. If no value is assigned to the resource, it cannot enter into economic calculations in either the public or private sphere; it cannot be a guide to decisions about investment or regulation—such decisions will perforce continue to be made either arbitrarily, or by political pressures, or by standards which are not precisely relevant, such as maximum biological potential. Where values in fish and wildlife compete with other values—as in the case of dams which interfere with salmon runs, or where lack of sewage treatment spoils oyster beds, or land drainage destroys spawning or nesting grounds—lack of value data may be quite a serious detriment to policy decisions.

For this reason we wish to enter a plea for estimates of the value of the resource as it would be under rational conditions of use. Such estimates can be made in many if not most cases without excessive difficulty. Moreover, both the commercial and recreational aspects of fishing are expected to rise greatly in importance in the decades ahead. It is high time to establish some benchmarks for future research and policy decisions.

(a) Commercial fisheries: The most practical method for valuation of commercial fisheries appears to be through estimation of the manpower and equipment technically required to make the optimum catch; i.e., the catch which would yield the maximum gross income over costs of capture and protection.<sup>2</sup>

Pilot studies of this kind have been made by Crutchfield, by Donald H. Frye, and by Lynch, Doherty, and Draheim.<sup>3</sup> The difference between total costs (including wages) at the optimum level of operation and the gross revenue expected at that level of operation would provide an estimate of the annual rent to be expected from a rationally operated fishery. This annual yield could then be capitalized at some acceptable rate of interest to give the desired estimate of capital value of the resource. A somewhat simpler calculation, yielding nearly the same results for many fisheries, would be to estimate the manpower and equipment charges minimally required to take in the present levels of catch. Subtracting these costs from those now in-

<sup>1</sup> James A. Crutchfield, "Valuation of Fishery Resources," *Land Economics*, May 1962, p. 146.

<sup>2</sup> One difficulty in this connection is that there is frequently only limited knowledge about the most effective techniques or their costs. Gear restrictions, season limitations, etc. are imposed for the purpose of decreasing efficiency, and the drive of the entrepreneurs for efficiency is pushed into artificial channels, such as vessels of excessive size or speed.

<sup>3</sup> William F. Royce, James A. Crutchfield, et al., "Salmon Gear Limitation in Northern Washington Waters" (Seattle, University of Washington Publications in Fisheries, vol. II, No. 1, 1963); D. H. Frye, "Potential Profits in the California Salmon Fishery," *California Fish and Game*, vol. 48, No. 4, October 1962; Edward J. Lynch, Richard M. Doherty, and George P. Draheim, "The Groundfish Industries of New England and Canada" (Washington, U.S. Fish and Wildlife Service, Circular 121, July 1961), in particular ch. III on haddock.



curred (which tend to equal total revenue) would give the annual yield of the resource to be capitalized.

These estimates can be supplemented in some cases by estimates based on the observed market value of fishing grounds where access has been limited and leased to particular fishing firms, as in the case of some oyster beds.

The most severe limitations on this approach to valuation of commercial fisheries will arise from (1) conditions in the high seas fisheries, where the share available to U.S. fishermen is not determinate, and competitive waste will be inevitable until adequate international agreements on sharing are reached; (2) uncertainty in the data, because of wide variations in the catch, or because exploitation of the species is new or underdeveloped.

(b) Sport fishing and hunting: The case of sport fishing and hunting is different, for the object here is not maximum efficiency in harvesting food, but maximum efficiency in providing recreation. Arbitrary limitations are generally provided to preserve the species and the sport, but monetary charges, other than license fees, are rare.

Nevertheless, it is proposed that admission or privilege fees charged by private operators be used as the basis for estimating the daily values of the different kinds and locations of recreational opportunities based on wildlife and fish. These daily values, multiplied by total use of each class of fishing or hunting resource—estimated along lines already begun in the National Survey of Hunting and Fishing—will yield estimates of total gross annual receipts for recreational use of these resources. The problems of comparability among different fishing and hunting opportunities will of course loom large in such an operation; but we believe the results will be well worth the effort. Some indication of the importance of the industry may be obtained from the fact that private expenditures on various goods and services in connection with fishing and hunting were estimated at \$3.85 billion in 1960 (as against \$2.85 billion in 1955),<sup>4</sup> and from the fact that large public expenditures will probably be needed soon in the field of recreation.<sup>5</sup>

The paucity of data on private charges for fishing and hunting will no doubt force resort to alternative approaches of a more hypothetical nature. One of considerable interest is that based on an inferred demand curve, derived from the rate of use (per 1,000 of population) of recreational sites by residents of cities of varying distances from the site.<sup>6</sup> Capitalizing of the maximum net income estimated to be derivable from user charges based on such a demand curve, would constitute the estimated marketable value of the resource.

Numerous considerations enter into judgments concerning the collectible charges on particular facilities, however, and amenities other than the fish and wildlife are certainly a consideration for most fishermen and hunters, so that it will not be possible to attribute the entire "rent" to the fauna. However, for lack of more solid ground, those working on development of water resources are currently using

<sup>4</sup> U.S. Fish and Wildlife Service, Circular 120, "1960 National Survey of Fishing and Hunting" (Washington, 1961), pp. 4-5.

<sup>5</sup> Marlon Clawson, "The Crisis in Outdoor Recreation," in *American Forests*, March and April 1959.

<sup>6</sup> Marlon Clawson, "Methods of Measuring the Demand for and Value of Outdoor Recreation," reprint 10, *Resources for the Future, Inc.*, Washington, February 1959.

a "judgment" table of daily unit values representing net income an operator might derive from fees for hunting and fishing. These range from \$0.50 to \$6, and were based in part on a limited survey of establishments levying such charges.<sup>7</sup>

#### APPLICATION OF THE VALUATION PROCESS

The census of fisheries described in (1) above will provide some basic data for valuation of the commercial fisheries. This should be supplemented by the considerable amount of related data available on the value of these manmade assets

For many specific fisheries it will be reasonable to assume that output is at or above the maximum physical yield the resource will sustain. In those instances it will be possible to estimate yield of the fishery with a rationalized number of inputs. In certain cases these estimates have already been prepared in usable form; in some additional cases, data are available which can be used as a basis for such estimates, for example the Pacific halibut fishery.<sup>8</sup>

This estimation process can be carried out largely by the economists and gear technologists of the Bureau of Commercial Fisheries. Given knowledge of the peculiarities of individual fisheries and especially of the relative productivity of particular units of gear, reasonable estimates can be prepared without extensive investigation in the field.

In the case of fish and wildlife resources as a base for recreational activity it will be necessary to continue and extend current efforts to estimate the demand for the utilization of those resources. Some complete and many partial estimates are available, based on demand studies already carried out.

On the valuation aspects of recreational fishing and hunting, administrative values assignable to daily units of activity are in regular use in river basin analysis. These values are considered to be net of associated development and operating costs. The \$0.50 to \$6 range of daily values chosen is based on a limited survey of operators of private shooting and fishing preserves and on the informed judgment of persons knowledgeable in the field.

In addition to the several thousand going operations in which daily fees are charged for hunting or fishing, there are a number of examples of leases of hunting and fishing rights which might assist in the establishment of values. It was recently estimated that seasonal leases for hunting deer in Texas, where hunting leases or charges are almost universal, range from \$15 to \$75 annually per hunter for "fair" hunting to \$100 to \$150 for "excellent" hunting. A Minnesota survey of 49 waterfowl hunting leases in 1959 found the average annual payment (revenue) to be \$409, or \$5.10 per acre. These are representative of a great and increasing number of hunting and fishing leases which might yield information of importance in establishing values.

<sup>7</sup> Inter-Agency Committee on Water Resources, Subcommittee on Evaluation Standards, "Report of the Panel on Recreational Values on a Proposed Interim Schedule of Values for Recreational Aspects of Fish and Wildlife," Washington, U.S. Department of the Interior, May 24, 1960.

<sup>8</sup> James Crutchfield and Arnold Zellner, "Economic Aspects of the Pacific Halibut Fishery," U.S. Department of the Interior, Bureau of Commercial Fisheries, April 1962.

## IX. PUBLIC LANDS SUBGROUP REPORT

One basic issue is which "public" lands to include. The attached checklist briefly describes the chief Federal, State, county, and city lands to be included. Although the Federal lands are grouped according to managing agency rather than according to land type, this is operationally sound because the estimates will almost surely be made by agencies and because there is some interest in separate figures for the lands administered by each agency. The checklist includes Indian lands, which are privately owned, but which might otherwise be overlooked. Their value should be included with the values of other private land. Similarly for privately owned in-holdings, within the various public land areas, which should not be overlooked, but included in private property.

Estimates of values of public land (as defined above) should exclude the values of commercial and other timber on the land, of minerals in the land, of publicly owned streets and highways not primarily for the use and enjoyment of these lands, and water originated from these lands. These values are excluded here because it is assumed that they will be included in the estimates of forests, minerals, etc. However, this requires that the groups estimating these latter values have separate subcategories for the forests, minerals, etc., on public lands, so that these values can be added to the values included in this statement, in order to get a total for public lands. The land value estimates to be covered in the public land category are those for the land alone, excluding values of the forests, minerals, etc. The land value of cutover forests would be included, for instance; also the bare land value of forest land, the value of whose trees was included under forest values. The value of grazing land, including grass and other forage, would be included since forage ordinarily does not have a value separate from the land.

One major problem is the degree of double counting involved in estimating values of public land. It seems probable that much, perhaps nearly all, of the values of the public land have been capitalized in the values of the private land, because the income from the use of public land generally accrues to the owners of private land used in the same productive enterprises. This is especially likely to be the case for grazing land values, less so for timberland and mineral values, and least of all for recreational values. However, there is much interest and value in separate estimates for public land. We propose that they be made on the basis described below, but that the values of the separate items be excluded from national totals of all wealth, to the extent that the various items represent double counting.

A related matter is the values arising out of multiple use of much public land. One can estimate separately a grazing value for a tract, a recreational value, a wildlife value, etc.; but in this case one must be careful that one type of value does not unintentionally include some of the value arising out of other uses. Or one can estimate a single value for each tract, which takes into account its manifold possibilities and uses. If done carefully, each method should yield the same or closely comparable results; the essential consideration is that the process be explicit.

Data are generally available on acreages of land in the various categories of public land shown in the attached checklist. While such data

are neither completely accurate nor perhaps wholly inclusive of all public land, yet the errors here are small compared with those in the land prices field.

The most serious deficiency for valuing public lands lies in the appropriate price to apply to acreage figures. For several reasons, it is not possible to use commercial sales prices. Much public land is never sold—one reason why national and other parks are in public ownership is to prevent their public sale. Purchase costs, even when known, are often irrelevant to present-day prices. Some public lands are sold, but often under prices or conditions determined by law, definitely divergent from competitive sales prices. Such sales prices in many instances would be more misleading than helpful. Use of public lands is also generally at charges or fees lower than commercial rates, ranging from zero or nearly so for many parks, to grazing fees well below commercial fees, and to other charges that more nearly approximate a full commercial lease price. Capitalization of such artificially low rentals would therefore be highly misleading.

After consideration of all approaches, and in full recognition of all the difficulties, the subcommittee proposes the establishment of a system of "shadow prices" for public lands. Specifically, we propose that there be established in every major area (a State, usually) an appraisal board. We think that, on the whole, it would be better to have a single board for each geographic area, to appraise the value of all public lands, than to have separate boards for the different kinds of land; but administrative or other reasons might lead to the establishment of different boards for different kinds of land. We think such boards should include the chief administrative officer for each major kind of public land within the general area (or his representative); any specialized appraisal personnel (such as Federal land bank appraisers) that might be available; agricultural college and other educational institutions personnel familiar with land values and incomes; and perhaps simply knowledgeable citizens in the area.

Such boards should seek to estimate the price per acre that the various types of public land would bring in the open market, if offered for sale in optimum size parcels. In arriving at this estimate, the board should use any and all relevant data—sales prices, when the sales reflected truly competitive sales conditions; sales prices of physically similar but privately owned land; any appraisals that might exist; or any other data. We judge, however, that most boards would be forced to come up with a "judgment" figure. We think it would be impossible for such boards to undertake research specifically for this problem, but of course they should use the results of any research existent. Moreover, given the intangibility of many of the values, we think boards should be discouraged from detailed appraisals; the desired figure is a reasonably accurate general average for rather large areas, not a specifically accurate figure for particular tracts.

In making this suggestion, the Subgroup is fully aware of the difficulties of arriving at such shadow prices, but we think this method more defensible than any other. As carefully drawn instruction as can be written and careful supervision during the process of estimating the shadow prices would help to produce more consistent, if not more accurate, results. We think it better to have a rough estimate for the properly defined price than to have an exact figure for the wrong kind of price.

CHECKLIST

I. Governmental units and jurisdictions to be considered in an inventory of public land resources:<sup>1</sup>

- A. Federal Government:
  - 1. Bureau of Land Management.
  - 2. Bureau of Sport Fisheries and Wildlife.
  - 3. Bureau of Indian Affairs.<sup>2</sup>
  - 4. Bureau of Reclamation.
  - 5. Park Service.
  - 6. Forest Service.
  - 7. Soil Conservation Service.
  - 8. Department of Defense.<sup>3</sup>
  - 9. Veterans' Administration.<sup>3</sup>
  - 10. Tennessee Valley Authority.<sup>4</sup>
  - 11. Bonneville Power Administration.<sup>4</sup>
  - 12. General Services Administration.<sup>4,5</sup>
- B. State governments.
- C. Counties.
- D. Cities and towns.
- E. Other political subdivisions:
  - 1. Water districts.
  - 2. Drainage districts.
  - 3. School districts.
  - 4. Other.

II. Uses of land to be considered in an inventory of public land resources,<sup>6</sup> and recommended jurisdiction:

<i>Uses</i>	<i>Recommended jurisdiction</i>
A. Forests and woodlands-----	Forest resources subgroup.
1. Commercial -----	Do.
2. Noncommercial -----	Do.
B. Minerals and petroleum-----	Minerals subgroup.
C. Grazing-----	
1. Domestic livestock-----	Public lands subgroup.
2. Wildlife <sup>7</sup> -----	Fisheries and wildlife.
D. Wildlife habitat-----	Do.
E. Recreation-----	Public lands subgroup.
1. Designated areas <sup>8</sup> -----	Do.
2. Nondesignated areas-----	Do.
F. Watershed <sup>9</sup> -----	Water resources subgroup.
1. Designated areas <sup>10</sup> -----	Do.
2. Nondesignated areas-----	Do.

<sup>1</sup> The estimates of public land wealth should be made in recognition of the concept of "multiple use"; any given parcel of land may have more than one use and yield more than one product or service. Thus an inventory might well include some values within the public lands concept as well as within some other concepts (e.g., grazing land within national forests or on military reservations, etc.) This checklist serves to indicate those agencies holding public lands that should be screened for inclusion in the "public land" concept by virtue of their uses, services, and product.

<sup>2</sup> Indian lands properly must be considered as private lands. They are owned by Indians and only held in trust by the Federal Government. They should be inventoried in the private sector, and are included in this list only as a reminder, lest they be overlooked.

<sup>3</sup> Some lands held by these agencies are used for grazing or other "public land" uses in addition to their primary purposes.

<sup>4</sup> Should be screened for appropriate inventory listings.

<sup>5</sup> Also a source of information about "public land" holdings of agencies not included in this checklist.

<sup>6</sup> Any given parcel of land may have more than one use, product, or service. For example, one area of publicly owned land may yield water, timber, and minerals, and be used for recreation, grazing, and wildlife habitat. This checklist of uses should be cross-referenced, in each category, against the checklist of governmental units.

<sup>7</sup> Grazing by "big game" such as deer, elk, moose, antelope, etc.

<sup>8</sup> "Designated areas" refers to National parks, State parks, and other identified campgrounds and recreation facilities. Much recreational use is made of publicly owned lands on areas not specifically identified or improved.

<sup>9</sup> Includes water management areas such as reservoirs.

<sup>10</sup> Some areas of publicly owned lands are set aside, or "designated," specifically as watersheds, but most watersheds are open to other uses.

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**APPENDIX II: PART G**  
**REPORT OF THE WORKING GROUP ON CONSTRUCTION**  
**WEALTH**

**Prepared by ROBINSON NEWCOMB and DAVID K. GILLOGLY**

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## MEMBERSHIP OF THE CONSTRUCTION WORKING GROUP

- Robinson Newcomb and David K. Gillogly (chairmen), Newcomb, Gillogly & Associates.
- Lawrence Bloomberg, Office of Statistical Standards, Bureau of the Budget.
- Sam Dennis, Census Bureau.
- D. A. Giampaoli, Associated General Contractors of America, Inc.
- Charles J. Haring, Washington, D.C.
- Benjamin W. Kelt, Office of the Chief of Engineers, Corps of Engineers.
- Paul F. Krueger, Office of Statistical Standards, Bureau of the Budget.
- J. J. Laing, Office of Research and Development, Bureau of Public Roads.
- Garth C. Mangum, Senate Labor and Welfare Committee staff, U.S. Senate.
- H. A. Radzikowski, Bureau of Public Roads.
- William H. Robertson, Office of the Chief of Engineers, Corps of Engineers.
- Morry R. Robinson, Bureau of Marketing Research, Cahners Publishing Co.
- Nathaniel Rogg, Economics Department, National Association of Home Builders.
- Aaron Sabghir, Business and Defense Services Administration.
- Lester C. Sartorius, Deere & Co.
- James Walker, Bureau of Labor Statistics.
- John E. Wiley, Materials and Services Division, American Road Builders Association.

## PREFACE

The Working Group on Construction Wealth met first on September 4, 1963, and again on February 12, 1964. A fairly detailed report had been prepared in the interim which formed the basis for discussion at the second meeting. As a result of discussions at the second meeting, a new draft report was prepared and circulated to the members of the working group.

Not all members of the working group attended both meetings or reviewed both drafts. In particular, a number of additional members were added to the working group after the first meeting. The list of working group members following the title page includes all persons who participated at all in this project. Dissenting comments and additions are included as footnotes. However, final responsibility for the following report rests with the chairmen.

Other persons who attended meetings of the working group and made helpful suggestions included John W. Kendrick, David J. Hyams, and Joel Popkin of the Wealth Study. Insights as to how the leasing industry operates were provided, through interview, by Bernard Schwartzman of Schwartzman Associates, Washington, D.C.

ROBINSON NEWCOMB.  
DAVID K. GILLOGLY.



## CONSTRUCTION

### I. GENERAL OBJECTIVES

#### THE WORKING GROUP

The Working Group on Wealth in the construction sector is charged with advising the main committee and staff on the Wealth Inventory Planning Study on the most suitable approaches to measurement of wealth assets of the construction sector, insofar as specialized knowledge of that sector is required. The working group was selected primarily from representatives of industry, trade associations, and Government, whose unique positions provide strategic insights to the pertinent issues. The group membership is presented on page ii of this report.

#### THE MAIN OBJECTIVES

The more specific general objectives include the following:

- (a) Determining potential data uses and users of wealth data on the construction sector.
- (b) Determining the practical data objectives of a wealth inventory of the construction sector.
- (c) Reviewing and appraising available data.
- (d) Determining the proper parameters of the construction sector with respect to data objectives, feasibility of measurement, and compatibility with the goal of measuring wealth in all sectors of the economy without overlap.
- (e) Assessing the probable characteristics of wealth assets employed in the construction sector, and relative significance for measurement.
- (f) Determining and analyzing the special problems that will exist with respect to proper and adequate measurement of the construction sectors wealth assets.
- (g) Making recommendations, in the light of the foregoing considerations, as to suitable approaches to the measurement of the wealth assets of the construction sectors, including suggestions of reasonable alternatives.

### II. POTENTIAL USES AND USERS OF CONSTRUCTION SECTOR WEALTH DATA

#### EXISTING USES

Since, with a few exceptions, almost no wealth data exists on the assets of the construction sector, there obviously is very little use of such data. One notable exception appears in the highway and road building areas. Periodic surveys by both the Bureau of Public Roads and by the American Road Builders Association have been conducted for various purposes—most often to determine capacity for expansion

with respect to proposed highway programs. The information collected is primarily related to the types of equipment, age, and capacity. Some dollar valuation data also are being obtained.

Equipment manufacturers make their own estimates and projections of equipment stocks, with respect to activity and future market expectations. These must be based on fragmentary information, and are likely to be quite crude and inaccurate.

Trade publications are known to have made crude surveys from time to time to demonstrate that their subscribers buy such equipment, and, therefore, provide a suitable advertising media for manufacturers.

The Bureau of Labor Statistics, in its labor input studies, attempts to determine the costs allocable to equipment usage (rental or depreciation costs) per thousand dollars of contract for various types of construction. This is a capital consumption figure and may not quite qualify as wealth data, but wealth data might have future use in such studies. The present figures are derived from fragmentary information, combined with knowledgeable judgments.

#### GENERAL USES

Wealth data have very little use, in their present state, except as a subject of academic curiosity. A great deal could be said about their potential usefulness by a variety of users—but little can be said along these lines which is unique to the construction industry. Potential uses common to all sectors, and uses in general economic analysis have been well covered in appendix I, part A. There is little need to duplicate here. However, many potential uses cannot be foreseen until the need arises. Some added general uses mentioned below may help supplement the staff paper:

If one of the chief uses of wealth data is in policy formulation, as by the Federal Government, then it likewise follows that its use is equally important to those who hope to influence policy formulation. This would include, for instance, nonprofit research foundations, and universities. It would include also private business firms and trade associations, and theoretically at least, consumers. As often as not, the findings of these groups are as influential in Federal policy formulation as is the Government's own initiative.

But of equal importance is the growing demand for sound economic planning in the private sector. Wealth estimates which would become a basis of improving productivity measurement would contribute to developing a sound factual foundation in collective-bargaining issues between labor and management; to forecasting; to policy on allocation of resources and research. The productivity area is particularly neglected in the construction industry due to the lack of adequate information.

Construction equipment producers and material manufacturers are sorely in need of data which would permit better analysis of their markets—both short and long term.

Construction firms could likewise utilize data which would permit an analysis of their operating efficiency with respect to size of firm, investment and renting policy, substitutions of capital and labor, etc.

It would seem essential that wealth data collected in the construction sector meet the test of usefulness for business purposes as well as for

Government policy formulation, if any significant collection expense is to be justified.

Some other possible uses in addition to those mentioned above could include the development of operating ratios and standards, analysis of opportunities for new product development, evaluation of IRS guideline life expectancies, estimates of capacity expansion potential, etc.

It is, of course, difficult to forecast the full range of potential uses of wealth data on the construction sector. Much depends on the ability to relate such information to other data.

Without elaborating here, it is appropriate to point out that the data gaps—both quantitative and qualitative—in basic economic intelligence on the construction industry are substantial. Thus, it would be misleading to suggest that wealth data, per se, had a very substantial priority among the needs for this sector. This is particularly so if the data cannot be collected or presented in a way that is compatible with important parts of the existing body of data.

### III. DATA OBJECTIVES

#### WEALTH DATA NEEDS

Data which would merely provide a general estimate of wealth of various general forms, but which fails to identify other important aspects, would be of marginal usefulness. Both national policy and practical business utilization require that the data be somewhat detailed. In particular, it is important to identify the industry of use as well as the industry of ownership. (A great deal of heavy equipment is leased in the construction industry.)

One aspect of the need for detail is the desirability of aggregating for comparability with other available data. While it may be necessary to aggregate by SIC industries, it should also be possible to aggregate also by national economic accounts, or, more important—according to the concepts and definitions of the construction industry itself as represented by existing statistical series.

#### REQUIREMENTS FOR WEALTH DATA BY THE CONSTRUCTION INDUSTRY

Requirements necessarily relate to both the potential users and the potential uses. As previously stated, it is difficult, if not impossible, to forecast what these might be in the future. The need for many types of data often doesn't become apparent until the data are actually available and analyzed. An example of this is shown by the components of change data developed in the national housing inventory in 1956. Although there was a vague understanding of the kinds of changes which occurred in the existing housing inventory, almost no one had anticipated the substantial extent of such changes. That lesson would suggest that statisticians, economists, and market analysts should tend to seek all of the useful details which can be reasonably obtained—even though not in obvious current demand—so long as new vehicles for data collection are not required, and the detail does not make the cost so high as to endanger the project.

The need for detail by sector has been mentioned in connection with the need for different data combinations for use with various other data series. Maximizing the collection would improve the quality of year-to-year revaluations, and perhaps reduce the need for frequent surveys. For instance, if equipment items are separately identified, future changes might be traced through shipments, transfers, and scrappage, so as to form a basis for a perpetual inventory wealth estimate.

The following constitute the five major types of details to be sought:

1. Details on the SIC industry type; e.g., probably at the four-digit level, to break out construction activity outside the contract construction sector, per se. Industry code 2433 (prefabricated wooden buildings and structural members) would provide a key data cell, for instance, in evaluating measurements of the use of wealth assets in construction process. The progressive transfer of construction processing to the manufacturing and other sectors is important in producing sound data, as well as evaluating the effects of this change.

2. Regional details would also be important. Labor input studies by BLS have revealed significant regional differences in the mix of labor, materials, and equipment in contract construction. There are important problems here, though, as construction equipment is mobile and many contractors are multi-State, nationwide, or worldwide operators.

3. Asset types. In addition to the separation of financial assets, land, buildings, and equipment, it would be desirable, if feasible, to identify equipment in very substantial detail. This is needed because of the problem of rapid obsolescence, as well as for other reasons.

4. Asset characteristics. For equipment it would be desirable to have data on quantities, sizes, capacity, age and life expectancy, maintenance costs, rental costs, operator requirements (or some measure of productivity per man-hour), etc.

5. Evaluation details. It would be desirable to have evaluation data of several types—including book values, market values, original cost basis, depreciation allowances—and perhaps some basis for capitalization of earnings. This will be difficult to handle.

It is particularly important in the construction industry to obtain information on wealth assets *used*—irrespective of the industry of *ownership*. Leasing and/or rental of major equipment items is apparently common. Another detail which is possibly desirable is an inventory of options. Separate options both for extension of leases and for purchase of leased equipment are quite common in connection with long-term equipment leases. This type of option generally has a value much greater than the amount required to exercise it. Another type of option is possibly of greater importance, and this is the option on land which is in common use among operative builders. Almost nothing is known about the latter, but it may represent a significant claim on wealth assets.

#### GOVERNMENT USE

Data on the amount of equipment and other capital used in the construction industry will be of relatively little value to the Government or anyone else if it is just one overall figure. But as a basis for judgments as to productivity, changes in productivity, capital attached to

the industry, trends in efficiency and use of capital, and the amount of capital required to expand the construction industry, such data would be valuable.

It has been assumed by many that productivity is low and is improving only slowly in the construction industry. The construction industry accounts for about 11 percent of the total GNP and the value added by the on-site construction operations themselves is possibly in the order of 45 percent of total construction activity. The trends in efficiency and in capital requirements of 11 and 5 percent of the activity of the country is important enough to affect allocation of resources. If construction is becoming more efficient, there will be a trend toward more construction activity though not necessarily toward greater expenditures for construction. Judgments as to labor and capital requirements in the construction industry are an important part of the Department of Labor's projections and should have a bearing on decisions on tax policies and Government policies affecting highways, as well as housing, urban development, and metropolitan planning as a whole.

#### PRIVATE USE

Private use of data of the sort we are discussing would be more specific in some respects and more difficult to describe in others.

Producers of construction equipment are woefully ignorant of the stock in the hands of contractors and others doing construction operations. As a result, orders tend to fluctuate relatively sharply. When business starts to pick up, contractors order too much. When business levels off, contractors' orders drop too much. The production of construction equipment varies far more than does the construction activity itself. So inventories in the hands of contractors tend to fluctuate and, of course, employment among the firms turning out equipment fluctuates, too. Data which would help production firms to gauge stocks in the hands of builders, and the requirements for the coming year would be useful. It would help leasing and rental firms as well as help production firms.

#### SOME USEFUL DETAILS

Many of the potential uses depend, of course, on the nature and extent of detail. Few useful judgments could be made about the function of investment in the construction industry on the basis of value data above. Information is needed on—

- (a) Types, age, and capacity of equipment items.
- (b) Utilization rates by type (some highly specialized machines may be used only infrequently—as needed).
- (c) Lease or rental versus ownership practice re various types.
- (d) Forms of organization (legal, relationships to other firms, etc.).
- (e) Obsolescence factors—rapid innovation in machines in obsolescing much equipment before it would otherwise be depreciated.
- (f) Other significant business interests of construction firms.
- (g) Allocation of assets by both usage and ownership.
- (h) Attachments and modifications to above equipment items.

## IV. REVIEW AND APPRAISAL OF AVAILABLE DATA

## IRS DATA

The following is a breakdown of the type of assets held by corporations in the contract construction group reporting to IRS for fiscal year 1961:

	<i>Billions</i>
Cash.....	\$1.6
Receivables.....	5.6
Inventories.....	1.6
Investments.....	1.7
Depreciable assets.....	12.5
Depletable assets.....	.1
Land.....	.3
Other.....	1.9
<b>Total.....</b>	<b>15.4</b>

<sup>1</sup> \$5.4 less depreciation allowance of \$2.9 equals net book value of \$2.5.

As previously mentioned, however, there are three facts which make these figures of little value even as orders of magnitude: (1) the construction industry uses a substantial but unknown amount of leased and rented equipment; (2) the IRS reports do not begin to represent the total construction industry; and (3) construction firms may own assets used for business interests other than construction.

The following list provides data on the number of firms reporting in fiscal year 1961, broken down by type of contractor and legal form of business. This list excludes approximately 48,000 corporations and an unidentified number of noncorporate firms listed as operative builders under an SIC real estate classification. The published breakdown on operative builders is not as fully detailed as that for contractors, and noncorporate operative builders are not identified separately from other real estate operatives. There is a substantial overlap of operative builders with general contractors, and with some who may report as special trade contractors, as well as other businesses. These 48,000 builders reported only \$1.7 billion receipts—but houses "built for sale" during the period should have totaled around \$10 billion. Some part of the difference may be in noncorporate returns, not identified separately in published data.

*Firms*  
[Thousands]

	Total	Proprietors	Partnerships	Corporations including 1120-S
All construction firms.....	799	655	63	81
General contractors.....	163	110	18	35
Special trade contractors.....	595	511	41	43
Not allocable.....	41	34	4	3

NOTE 1.—Includes 204 consolidated returns involving 524 subsidiaries. No information on number of subsidiaries and affiliates filing separately.

NOTE 2.—Subdividers, developers, and operative builders—not included above—(corporate only) reported receipts of \$1,800,000,000 for 48,000 firms.

*Gross receipts*

[Billions of dollars]

	Total	Proprietors	Partnerships	Corporations including 1120-S
All construction firms.....	55	15	7	33
General contractors.....	30	6	4	20
Special trade contractors.....	23	8	3	12
Not allocable.....	1	1	(1)	(1)

<sup>1</sup> Less than one-half billion dollars.

*Assets*

[Billions of dollars]

	Total	Proprietors	Partnerships	Corporations including 1120-S
All construction firms.....	(25)			15
General contractors.....	(15)			10
Special trade contractors.....	(9)			5
Not allocable.....	(1)			(1)

<sup>1</sup> Less than one-half billion dollars.

NOTE.—Figures in parentheses estimated from corporate assets to receipts ratios.

Source: Statistics of June 1960-61, IRS.

OASI data follows approximately the same classification system as IRS.

The problem of identifying construction firms is critical. The most thorough research would have difficulty in identifying all important construction firms no matter how it is done. Methods considered have included the use of phone books, directories, mailing lists, trade publication subscribers, trade association membership lists, IRS returns, and OASI data. A study of the construction industry done recently for Producer's Council turned up the fact that small subcontractors tend to work mostly for a single operative builder account. The rest of their work consists of minor contract work plus repair services to the public. This is particularly true in case of trades like plumbing and electrical work. The possibility that these firms would either not be listed in any directory at all, or would be listed under repair service categories, seems quite high.

## DATA ON INVENTORIES OF UNSOLD NEW CONSTRUCTION

A new survey initiated a couple of years ago by the Bureau of the Census does provide quarterly figures on the inventory of unsold houses, both completed and under construction, and in the hand of operative builders. These data are in terms of numbers of units but can be readily converted to market value (except for difficulties in separating land value from new construction value).

## CONSTRUCTION PUT IN PLACE

Deficiencies in the construction put-in-place data are well known. While this is activity data rather than wealth data for the construction industry, the product represents additions to wealth in other sectors. Maintenance and repair data are not included, and the Census Bureau states that their coverage, particularly of force account work, may be substantially incomplete.

## LABOR INPUT DATA

One other item which deserves mention are the BLS Labor Input Studies which, as a byproduct, develop information on equipment usage. These have covered various types of contract construction, and much of the data on the actual types of equipment used has not been published. Such data are presumably available at BLS. (BLS charged depreciation costs into projects on a per thousands of dollars of contract value basis.)

## WEALTH INVENTORY CHANGES

There is a substantial variety of data on new construction, the production and shipment of durable goods and producer's equipment, etc., all of which represent gross additions to wealth. But we have almost no data which would indicate scrappage, abandonments, or other conversions, which would permit a compilation of net figures.

## MAINTENANCE AND REPAIR DATA

The conceptual issue of the treatment of maintenance and repair service as part of the construction industry was discussed earlier in this draft. Estimates of the total volume of maintenance and repair are compiled annually with no breakout. A new series which attempts to differentiate between maintenance and repair, replacements, and additions and alterations—for residential construction only, has been under development by the Bureau of the Census (series C-50).

## CONSTRUCTION CONTRACT DATA

This is actually similar to the construction put-in-place data except for timing differences, and forms a large part of the basis for put-in-place data together with building permit data and public construction data collected from various sources. It probably suffers from substantial omissions of small contracts and force account work.

## EMPLOYMENT DATA

BLS data follows SIC breakdowns and is unsatisfactory for reasons similar to those which make IRS data unusable. Employment data from the CPS sample surveys of census are at higher levels, but still suffer from industry classification problems. CPS data classified by occupation are also not usable, since many of the same trades appear in shipbuilding, mining, cabinetmaking, electronics, etc. Common labor cuts across all industry definitions.



## V. DEFINITIONS OF THE CONSTRUCTION SECTOR

## WHAT IS CONSTRUCTION?

Construction could be liberally defined as any manmade alteration of real property—other than mining, timbering, quarrying, well drilling, or agriculture. (Some of these activities also include force account new construction, as well as operations that are closely related. A clear division may not be possible.) Generally speaking, construction could be broken down into the following categories:

- (a) New buildings.
- (b) Nonbuilding structures (bridges, dams, etc.).
- (c) Nonbuilding, nonstructural construction—such as highways, dikes, and other earthworks.
- (d) Site preparation including grading and excavation.
- (e) Additions and alterations to existing construction.
- (f) Maintenance and repair of existing construction (other than custodial services, etc.).
- (g) Demolition and removal of existing construction.

Inclusion of maintenance and repair is a controversial subject, partly because it is generally an expense item rather than a capital investment item. Even though construction as an industry performs repairs, this activity is not normally treated as construction in other economic accounts or other commonly used statistical series. Data collection and estimates on the activity are limited. A large proportion of the activity is by force account, and by households. However, there are many arguments for its inclusion. It consumes similar materials and utilizes much of the same work force and equipment as does construction. It also renews capital and offsets real depreciation, irrespective of accounting practices. On balance, it should probably be included in any comprehensive definition of "construction."

An item not ordinarily included as part of construction activities is architectural and engineering services. It should probably be included. Similar services are automatically included in manufacturing, wholesaling, and retailing trades. It is a direct cost in the construction process and not merely an overhead item, though it is traditionally treated separately. It is rather easily isolated, although some architects and designers are in the employ of the construction industry and the value of their work is then included in reports. The fees and receipts of independent architectural and engineering firms run to about \$1.5 billion per year. In addition, there is an unknown expenditure of this type by many firms employing contractors, and by governmental agencies. Such firms are sometimes directly engaged in construction and would thus own or use equipment assets.

As a generalization, construction activity is most often regarded as that activity carried on at the construction site. The use of more sophisticated materials and methods has gradually reduced the amount of actual work performed at the site. A builder or contractor may fabricate large parts of the construction either at a central location on site or in an off-site shop. By some definitions this would constitute manufacturing rather than construction. But it would be most commonly regarded as construction. The so-called manufactured housing industry (and prefabricated component manufacturing) con-

stitutes a gray area, since it primarily duplicates construction, using the same materials and approximately the same methods. It gains its efficiency through supervised shop conditions, and the use of jigs and larger machinery. House manufacturing and prefabrication can take place also in the shops of lumber dealers, etc. These activities obviously must be taken into account in any measures of construction productivity, etc.

#### WHO DOES CONSTRUCTION ?

The construction industry as defined by SIC may account for about 75 percent of the reported construction volume put in place. The series generally omits engineering and architectural fees, since these are not included in construction contracts. It excludes also the profits of operative builders, but does include the profits of general contractors (and subcontractors as well).

Three other types of "construction operatives" deserve mention: (a) Investment builders, who do part or all of their own construction for investment on their own account, Webb & Knapp is an example; (b) land developers who prepare sites for sale to others may do their own grading, streets, utilities, etc.; (c) owner-builders who build (all or in part) their own living quarters, vacation houses, etc.

In addition to contract construction accounted for by the SIC construction classification, perhaps as much as \$10 billion annually is received by operative builders, who are classified as "real estate" rather than "construction" firms. Business and government firms in all economic sections may have handled 20 percent of construction activity on force account. Transportation firms, chemical and petrochemical firms, and utilities particularly do substantial force account construction. Contract construction is also carried on in substantial quantities by a number of other industries not classified as "construction" in SIC. American Bridge Division of United States Steel for instance, is a construction organization of substantial size. Large department store chains—in particular, Montgomery Ward and Sears, Roebuck—have been getting increasingly involved in contract construction. They are primarily active in the home remodeling field, but also erect small prefabricated buildings, such as garages. A number of home manufacturers are also directly involved in construction activity—both as contractors and operative builders. Building materials' dealers are also frequently active as both contractors and operative builders. The main point which all this illustrates is that the SIC classifications are almost wholly inadequate to identify the industry.

The nature of construction, as it affects our problem, is an operation that is carried on by all types of industries. It is not an operation handled only by a "construction industry" as such. It does not therefore lend itself to standard classification or tabulation procedures. It resembles the transportation industry in some respects. A company may ship goods by common carriers—by rail, road, or air—or it may use its own trucks, or on occasion its own planes. And individuals may travel by commercial air, bus, or rail carrier, or use their own cars or planes. A standard industrial classification system which secured perfect reports from all transportation companies on the capital they used, would still miss major parts of transportation operations. But many, though not all of the transportation omissions could be caught

through the use of entirely separate statistical series, such as auto and truck registrations, and related data and totals could be developed by inferences. No comparable cross-check device exists for construction.

In short, there seems no basis for simple estimates of the sector's wealth assets, no matter how the sector is defined. All that can be done is to develop specific wealth data from specific contractors who report both their wealth and their activity. By getting an adequate sample, it would be possible to develop factors which could be used to develop estimates consistent with specific definitions and universes.

## VI. CHARACTERISTICS OF WEALTH ASSETS EMPLOYED IN THE CONSTRUCTION SECTOR

### TYPE OF WEALTH ASSETS EXPECTED

The construction industry assets structure can be fairly well anticipated. As far as contract construction is concerned, the principal tangible wealth asset should apparently be equipment. There also could be a fair amount of materials and undelivered work in process. Financial assets, of course, will be found, as in any other line of commerce. Since office operations are minimal in contract construction, buildings and land *may* comprise only a minor part of assets. Aside from small offices, the major buildings used would be sheds for storage of equipment. The equipment assets of contractors consist primarily of such items as earthmoving equipment, cranes, grading equipment, paving equipment, portable scaffolding, generators, pumps, and a variety of other large ticket items.

The operative homebuilder on the other hand usually possesses very little in the way of equipment items, but could be a very large holder of wealth assets. He may be holding a large inventory of undeveloped land held for future development. If he has an active subdivision, he may have several model homes, usually furnished. These houses together with their furnishing might be regarded as "display fixtures," and may aggregate as much as \$0.5 to \$1.5 billion. The operative builder plays a dual role of producer and retail merchant. Some operate exclusively by taking orders from their model homes, while others operate basically as inventory merchants ("speculative builders"). The majority probably do a combination of both operative and speculative building, and their principal wealth asset is an inventory of unsold homes—both in process and completed. New survey data from the Census Bureau indicates that this inventory of unsold homes, as distinguished from display houses, may run anywhere from 200,000 to 400,000 units—with a value of from \$2 to \$5 billion.

Small homebuilders and trade contractors will usually own such items as autos, jeeps, station wagons, power generator, pumps, small trucks, and a variety of handtools and portable power tools. For any one operator the value may be small—say \$5,000 to \$10,000 as the range of a likely average. But with nearly 800,000 firms reporting to IRS under contract construction alone, the total volume could well run several billion dollars.

## ORDER OF MAGNITUDE OF CONSTRUCTION SECTOR ASSETS

The reported volume of construction put in place per year is running in the neighborhood of \$65 billion. An all-inclusive definition and perfect reporting might add \$30 billion to this figure. But the value added by construction operations themselves is much less. If, as a very rough estimate, it is assumed that on-site employment represents 30 percent and that overhead and profits of the site operations represent 15 percent of the value put in place, the value added by reported construction operations may be less than \$30 billion per year. If each dollar of capital used in construction turns out \$1 in value added, the total value of capital involved in reported construction operations may be somewhere in the neighborhood of \$30 billion. If the total value of all reproducible tangible assets in the country is now in the neighborhood of \$1.5 trillion and the total national wealth in the neighborhood of \$2 trillion, this figure of \$30 billion represents under 2 percent of the assets of the country, and 10 percent of the total stock of durable equipment. This is a large enough proportion of the total to be worth examining with some care, but it may not be large enough to be worth expensive and painstaking efforts, for instance, to hold errors to within 5 percent.

## OTHER ASSETS

Just as construction-type assets will be found in other sectors, so will assets allocable to other types of activity be found in the construction sector—depending principally on the firms “primary” activity. There is no doubt a *major* overlap in the operative builder type of activity (classed by SIC under “real estate”).

## OPTIONS

Options on leased equipment may represent substantial value not on books, and are discussed in section headed “The Leasing and Rental Questions” found below. But land options are another item—this being a common method of holding land inventory for operative building. No tangible data exists on the extent and nature of the practice, but some builders are known to option land as far as 5 years ahead of projected development. The option price may often represent a substantial portion of the total price to be paid, for various reasons peculiar to the business.

## VII. SPECIAL PROBLEMS

## GENERAL COMMENT

Special problems are in evidence throughout this report, and this section does not undertake a complete itemization that would require repetitive comment. Some items mentioned elsewhere are nonetheless further commented upon here, when appropriate.

## THE LEASING AND RENTAL QUESTIONS

The questions of leased and rented equipment would seem to pose special problems for the wealth inventory. One important aspect of the question is the distinction between renting and leasing. There may not be an important dictionary distinction, but so far as the "leasing" is concerned, there is a very important distinction. Renting generally refers to a short-term contract for a piece of equipment by the day, week, or year, and is strictly an expense item. There are no options on renewal contracts, and the payment is entirely for the use of the equipment. In some instances, it is virtually impossible to distinguish renting from subcontracting because the rental requirements may sometimes provide that the "rental" organization also furnish the operator (as well as other maintenance personnel, etc.).

Though it would seem reasonable to expect that the rent-with-operator type of operation would generally identify itself as a subcontractor rather than a rental establishment, we have no real assurance that this is so—and such firms in practice, identify themselves as in the rental business.

Leasing on the other hand, almost always refers to a special type of contract, which normally amortizes the full purchase price of the equipment over the period of a relatively long-term lease. The unique feature of the lease is that it generally involves an option to purchase the equipment item at the end of the lease period. Options are generally included in an entirely separate document, since the Internal Revenue Service (IRS) has recently ruled that a lease with option to purchase is a conditional sales agreement and thus monthly lease payments would not be deductible as rent. The dual document arrangement, however, is apparently acceptable to IRS, or at least they have as yet found no way to block its use. Nonetheless, the purpose of amortizing investment over a relatively short period of time for tax purposes is still being achieved.

A typical lease arrangement would provide for perhaps a 3- or 4-year term on a piece of equipment with a life expectancy of 10 years. A \$100,000 item, for instance, might have monthly rental payments of \$3,500. At the end of the 3-year lease, the lessee could exercise the option—normally 10 percent of the original purchase price—and take title to the equipment. The mathematics are complicated but there is an immediate savings in taxes which usually more than offset the cost of this approach to financing—both in the short and long run. The tax benefits can, of course, vary widely from firm to firm, and will depend in part on the terms negotiated. Leasing companies tend to regard themselves more as financial institutions than as rental companies. They carry no physical inventory and normally deal mostly with *new* equipment, most often selected and arranged for by the lessee. Manufacturers of equipment also deal through lease arrangements directly for their own account. There are, of course, many other reasons for leasing besides tax advantages. These needn't be explored here.

What may be important is to realize that the lease *is* basically a method of financing or acquiring wealth assets. The contractor firm which leases equipment is not only the user of the equipment, but also is in virtual full control and possession of the equipment, and further

holds an option which virtually assures transfer of title if the lease has any maturity at all. The option itself is a kind of redeemable claim which will probably never show in the accounts. It may not be carried on the company's books. But the option on the above example lease may have a market value between \$60,000 to \$70,000 when the lease expires, and could have a discounted present value as high as \$50,000.

One reason for belaboring the leasing question is that for survey purposes, a contractor may regard the equipment as actually owned—since he has possession of it and intends to retain it. Since this could result in double accounting, questions on a wealth survey should probably be carefully worked out to separately count owned, leased, and rented equipment.

This is believed to have caused duplication problems in some of the highway capacity studies, since some contractors tended to list equipment they felt they had access to by rental as well as that owned. The problem is particularly affected by the common practice of contractors to rent idle equipment to other contractors.

#### IDENTIFICATION OF FIRMS

The SIC approach to the wealth inventory is almost a predetermined necessity—both to assume complete coverage and to prevent duplication in the inventory. Reports by firms must be tabulated by detailed SIC classifications so that they can be blown up to match both the contract industry universe and the construction activity universe.

#### SEASONALITY

Another type of problem which must be faced is seasonality. The equipment in the hands of contractors and others doing construction work, and in the hands of lessors, may not vary greatly in total from season to season, but the amount of equipment in use, or in the hands of contractors, will change with the seasons. The amount of equipment which is rented in June in Northern States may be appreciably greater than the amount that is rented in February. But a figure for the equipment on hand, *on an average*, throughout the year, might serve our purpose.

Inventories on the site and owned by contractors will vary sharply not only seasonally but as work progresses. A job 90 percent finished may have very very little equipment that is not in use, or material which is not in place. Similarly, a job which is just 10 percent underway may have relatively little material on the site, but considerable equipment being prepared for use, and a large amount of material on order. A job half done may have a large amount of materials and equipment on site, or otherwise owned by the contractor. Careful attention would have to be paid to definitions of "materials" and "inventories," and possibly to relating returns to the status of the job being reported, or it may be advisable to ignore the value of materials or of equipment which is due to be incorporated into buildings or other projects.

## MULTIPLE CORPORATIONS

Industry authorities report that the use of multiple corporations is common among the larger contracting firms. These may be formed along several different patterns of ownership, legal form, and functional purpose. One not infrequent form is for all equipment to be placed in a separate corporation and leased to the corporation actually doing the construction. Unless it is a wholly owned subsidiary, the leasing corporation would probably not ordinarily report as a contracting firm. This would further impair IRS data, or the use of IRS reporting, as a medium for collecting wealth data on any kind of useful basis.

Operative homebuilding operations likewise utilize multiple corporations for a wide variety of legal purposes. *Collapsible* corporations offer a particular problem in identifying firms and maintaining continuity.

## TURNOVER OF FIRMS

The turnover of construction firms is known to be quite high—but little is known about it other than that the industry has the highest failure rate of any major sector. But many more firms are in and out for purely discretionary reasons, or because they weren't low bidders on contracts, or because they "graduated" to something else, etc. The turnover could be as high as 20 percent, including new entrants.

## VALUATION PROBLEMS

New earthmoving equipment now coming on the market has much greater capacity and horsepower per unit than a few years back. Thus we are adding fewer machines but just as much capacity—possibly at less cost per unit of capacity. Across a broad spectrum, obsolescence is affecting valuation of equipment perhaps faster than depreciation, but at much different rates for different types of equipment. Use of age tables for depreciation of original cost may not work satisfactorily on construction equipment. A side aspect of the problem—wide regional variations in wage rates may make a piece of equipment obsolete in one area but quite acceptable in another area (there may be a similar effect between union and nonunion contractors).

## VIII. RECOMMENDATIONS

## CENSUS OF CONSTRUCTION

Inclusion of wealth inventory data objectives in the proposed census of construction could easily be the most important single recommendation this group can make. Hopefully, such a census would not limit itself to the SIC contract construction definition. But for the purposes of overall wealth inventory, firms could be identified by their SIC group.

Though there is as yet no decision to mount a construction census, the combination of the dual objectives could well provide the added potential yield that would make the need for a construction census more compelling.

The addition to the collection task would probably be minor; a separate survey of wealth for this sector could be avoided; and the wealth, establishment, and activity data would be compatible. From the viewpoint of those specifically interested in the construction sector, at least, this would seem by far the best solution.

The most difficult and costly part of either a construction census, or a wealth inventory (construction sector) may be that of adequately identifying the firms and determining the universe. If it is done for either, it is essentially accomplished for the other.

#### CENSUS OF STRUCTURES

A census of structures would seem to be an obvious and much needed extension of the Federal census system. Such a census would go a long way toward providing wealth data, though it could conceivably present problems of reconciliation with data collected on an industry or SIC sector basis. This, however, is not the problem of this committee.

#### USE OF IRS RECORDS

The committee recommends against any attempt to use IRS records or an expansion of IRS reporting as a *primary* vehicle for developing wealth data.

Such data would be of little use to the construction industry, or to those interested in relating wealth data in any meaningful way to other data on the construction sector—because of the many problems which clutter the definitional area.

There is some possibility of using IRS and OASI as a secondary device for identification of firms along SIC lines to prevent overlaps and insure full coverage of all sectors—but beyond that, the complexities of developing rational usable information on construction are greater than the results would warrant by this approach.

#### VALUATION OF EQUIPMENT

Equipment appears to be the main valuation problem unique to the construction sector. Presumably, other valuation problems which are common to all sectors are the responsibility of the advisory committee or other.

Since obsolescence appears recently to be having as much or greater effect on true values of equipment than does actual depreciation, traditional approaches to valuing these assets may be unrealistic. Thus, as a suggestion, a panel of experts from the equipment industry, and others as appropriate, might be used to establish a schedule of market values for equipment similar to the "blue book" in common usage for determining the value of motor vehicles. This would, of course, require collection of the equipment inventory data in physical terms—make, model, age, capacity, and original cost. This would be desirable



in its own right—irrespective of method of converting to dollar value, and would provide the best basis of updating wealth estimates on an annual basis.

#### VALUATION OF LEASES AND OPTIONS

The working group wishes to point out that options to purchase are a form of financial claim not ordinarily carried on books of account or reported in any set of financial data. Since they may have a value well beyond their original cost, or cost to exercise, they can be expected to be used in most instances. These may not be of such magnitude that they are worth the trouble of getting at—but they at least should be considered. As a very rough guess, the net value outstanding—*all sectors*—may run above \$1 billion.

#### USE OF TRADE ASSOCIATIONS

Informal inquiries suggest that most of the significant trade associations connected with the construction industry would be willing to cooperate in surveying their memberships with respect to an inventory of wealth assets. A good deal could be accomplished through mail surveys this way, and the trade associations through their good offices would probably facilitate better cooperation—either with mail surveys or interviews—than could be obtained without their help.

This approach would have both advantages and disadvantages. Trade association membership is not necessarily a representative cross section of the universe—and it would be necessary to determine what characteristics members and nonmembers had in common that would permit imputing survey results to the universe and how these two “sub-universes” were stratified. There would also be many problems involved in identifying the universe. (These problems are not discussed in this report, in detail—since they have been well covered in an unpublished report prepared by Garth Mangum for the Bureau of the Census relative to the census of construction.)

An advantage of using a trade association approach is that their memberships usually include most of the largest contractors. Since the size distribution of contract firms is highly skewed, there is an obvious requirement for high sample ratios among the largest contractors. Small sample ratios will generally suffice for the smaller, nonmember firms.

This approach might, for instance, start with preparation of a working draft listing the types of data and detail to be sought. Proposals could be worked out in detail with representatives of AGC, National Association of Home Builders, the American Road Builders Association, some of the larger public utility companies, some of the larger engineering and architectural firms, such as those turning out chemical and petrochemical plants, and with lessors and renters of construction equipment, for specific types of questionnaires. Since some of the data yield might be of specific use to these organizations, including the possibility of special questions or cross-tabs, there may be some opportunity to negotiate cost-sharing contracts with them on a limited basis.

## INSTANTANEOUS VERSUS ANNUAL MEASUREMENT

If estimation of the Nation's total wealth were a sole objective, then ideally, instantaneous measurement of the ownership of wealth assets would be most desirable—that is, all assets owned as of June 30, 1965, for instance. However, because of the widespread practice of leasing and renting, both between firms within the sector, and between other firms, and because of the seasonality of construction, such a figure would have very little realistic value from the industry point of view. In addition to the leasing and renting companies, both manufacturers and the Federal Government lease equipment to other sectors, including construction. It may thus be necessary to collect information on both an instantaneous and an annual measurement basis. On the annual basis, the schedule of assets would list assets together with an estimate of the time the asset was held, such as 2 weeks, 3 months, and so forth, including both leased and renting equipment, as well as equipment purchased sometime during the year, or disposed of during the year. This kind of data might create problems of overlap, and so forth, and the instantaneous data, if also collected, could be used to reconcile the accounts.

## OWNERS VERSUS USERS

When the wide variety of means by which assets are held by the construction industry is viewed, it becomes obvious that ownership is not as pertinent as usage—at least insofar as relating capital investment requirements to activity. If practical, it is recommended a schedule of assets be accompanied by a schedule which indicates percent of time used, percent of time idle, and percent of time leased to others, including an indication of the sectors to which the asset is being leased or rented.

## IDENTIFICATION OF FIRMS

As pointed out previously, a very significant portion of construction activity may be conducted by firms which will not identify themselves as primarily engaged in contract construction. It is necessary, however, to avoid duplication of reports from firms which report their wealth under other classifications. So reporting must be limited to contract construction categories, and to others which can be clearly separated from other categories. The anomaly of investment builders and operative builders, heavily engaged in residential construction but nonetheless classified under the "catchall" sector of finance, insurance, and real estate, makes a straight SIC approach very unsatisfactory for the use of those interested in construction as an industry. So also the construction activity engaged by retail lumber materials dealers, materials and component manufacturers, financial institutions such as insurance companies, and major divisions of large multiple interest companies—such as the American Bridge Division of United States Steel, or the Kaiser Engineering Division of Kaiser Industries. Where possible, such firms should be put in separate cells so their data will not be included twice, and so that these important forms of activity can be included in construction, but not included twice in totals.

The best approach to developing comprehensive data on the construction industry as distinguished from construction activity, if this

could be done, would seem to be to identify the construction activity itself, as a means of identifying the firms engaged in it, at that time determining how they would be classified under SIC. Experiments should be undertaken to see to what extent this could be done.

To summarize, the approach which seems to offer the best possibilities of meeting the broadest range of requirements, still producing satisfactory data on wealth, seems to be through use of a census of construction. If this is not feasible, sample studies should be made using IRS and OASI classifications, and using time intervals or timespans which would allow for seasonal variations. Totals should be blown up by cells using all sources available for estimating the universe. Trade association technicians and executives, as well as Government officials, should be relied upon heavily in the operation.

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APPENDIX II: PART H  
REPORT OF THE WORKING GROUP ON  
MANUFACTURING WEALTH

Prepared by JOEL POPKIN

MEMBERSHIP OF THE WORKING GROUP ON MANUFACTURING WEALTH

- Maxwell, R. Conklin, Industry Division, Bureau of the Census.  
Peter Gajewski, Division of Research and Statistics, Federal Reserve Board.  
Patrick Huntley, Business and Defense Services Administration, Department of Commerce.  
Lester S. Kellogg, director of economic research, Deere & Co.  
W. H. Krome George, economic evaluation division, Aluminum Co. of America.  
Milton Moss, Office of Statistical Standards, Bureau of the Budget.  
Vito Natrella, Office of Economic Research, Securities and Exchange Commission.  
Ralph L. Nelson (chairman), Director of the Foundation Investment Study, Foundation Library Center.  
Joel Popkin (cosecretary), Wealth Inventory Planning Study, The George Washington University.  
Edward A. Robinson (cosecretary), Industry Division, Bureau of the Census.  
Benjamin Slatin, economist, American Paper & Pulp Association.  
Sidney Sonnenblum, National Planning Association.  
Robert C. Wasson, Office of Business Economics.  
Ashley Wright, economics section, Standard Oil Co. of New Jersey.

## PREFACE

The Working Group on Manufacturing Wealth was formed as part of the Wealth Inventory Planning Study. Its purpose has been to analyze the problems connected with, and prepare proposals for, the improvements of basic data and estimates required for a comprehensive inventory of the tangible wealth of the manufacturing sector.

The working group held meetings on June 26, August 29, and December 5, 1963. Additional discussions were held between individual members of the working group and Wealth Study research staff members.

Appreciation is due to Murray Dessel of the Census Bureau, who has provided the working group with material which has been incorporated in this report; to Joel Darmstadter of the National Planning Association who reviewed the drafts in behalf of Sidney Sonnenblum; and to John W. Kendrick who oriented the group on the nature of the Wealth Study and the overall uses of wealth data. In addition, appreciation is due to three members of the working group, Maxwell Conklin, Edward Robinson, and Robert Wasson, for the special reports they prepared which have been drawn upon for the group report.

While this report is the responsibility of the undersigned, every attempt has been made to present the consensus of working group opinion. However, no member should be held responsible for all the views and recommendations contained in the report.

JOEL POPKIN.

## MANUFACTURING

### I. INTRODUCTION

Any inquiry into capital formation in the American economy must place important emphasis on the manufacturing sector. Based on data available for 1956, the fixed assets (in constant 1929 dollars) of manufacturers accounted for almost 30 percent of the total fixed assets of all nonfarm business. The sector accounted for about 33 percent of private nonfarm employment and 29 percent of gross national product (1954 dollars) in that year, also. The importance of manufacturing in the total economy has caused the working group to weigh heavily the uses of wealth data, within both the sector and the economy, against the knowledge that the cost of obtaining data necessary to the preparation of meaningful and widely useful wealth estimates is not inconsiderable. While many of the uses to which any body of data can be put emerge subsequent to its publication, some current uses for tangible capital estimates in the manufacturing sector are discussed in the remainder of this section. It was considered important to take the current uses into account in planning improvements in existing data. The overall uses of wealth data are elaborated in the Wealth Inventory Planning Study staff report (see ch. II, and app. I, pt. A).

A comprehensive national wealth inventory would provide a benchmark for continuing wealth estimates to accompany the national income and product estimates, thus expanding the kit of tools for general economic analysis. In particular, capital output ratios for the economy and its industrial divisions are useful for studying past changes in productivity, and as a background for projections. Many manufacturing firms currently use similar, internally generated data in the same manner. Real capital stock estimates may be used in capacity studies, and related business cycle analysis and forecasting. The information required to prepare depreciated cost estimates of reproducible assets—ages, useful lives, depreciation curves—would most likely prove to be extremely useful in their own right. Age distributions of capital goods help in investment demand analysis; and estimates in considerable detail by type of good, and by age class, if available, would help in market analyses by capital goods manufacturers. The capital asset values would also have relevance to tax questions. All of these uses would also apply at the regional level if such a disaggregation were made. These estimates, in conjunction with other variables, could help explain regional differentials in levels or trend of economic development.

## II. REVIEW OF EXISTING DATA AND ESTIMATES

The scope of this data review is the definition of the manufacturing sector found in the "Standard Industrial Classification Manual." The sector comprises major groups 19 through 39. Where coverage of particular data differs from that of the SIC, the differences will be noted and explained.

## WEALTH DATA FROM GOVERNMENT SOURCES

*Census Bureau data*

For many years prior to 1920 the Census Bureau collected information on the historical cost of depreciable assets of manufacturers. However, because of problems of concept and definitions and inadequate accounting records of the respondents, the Bureau each year questioned the validity of these figures. The comment appearing in the "1919 Census of Manufactures" volume is typical:

The data compiled in respect to capital \* \* \* as well as to all preceding censuses of manufactures, have been so defective as to be of little value except as indicating general conditions. In fact, it has been repeatedly recommended by the census authorities that this inquiry be omitted from the schedule. While there are some establishments whose accounting systems are such that an accurate return for capital could be made, this is not true of the great majority, and the figures, therefore, do not show the actual amount of capital invested.

Since 1922, accounting definitions and practices have become more standardized and refined. Thus, the Census Bureau encountered little opposition and no major reporting difficulties when it added supplemental inquiries on assets and rental payments at manufacturing establishments to the "1957 Annual Survey of Manufactures" (form MC-D11).

The 1957 inquiry requested data on gross book value of assets (depreciable and depletable) as of the end of 1957, accumulated depreciation to the end of 1956, and depreciation and depletion during 1957. It was sent to 50,000 establishments in a universe of about 300,000 manufacturing establishments. The reported data were cast into universe estimates. Data were published by four-digit SIC industries at the U.S. level and two-digit, major groups at the State level. The gross book value data reflect actual cost at the time of acquisition plus costs, such as transportation and installation, incurred to make the assets usable. Depreciation and depletion appear to have been reported generally on the accelerated basis used for tax purposes, although respondents were given the option of using alternative methods. Increasing interest in industrial wealth, and company-level statistics, led to many requests for the collection of information on assets and rent, both at the manufacturing establishment level and the company level through the 1963 economic census.

After much discussion, the 1963 asset inquiries which were submitted to the Bureau of the Budget for approval requested both manufacturing establishment and company-level information on the following: (1) gross value of depreciable and depletable assets at the beginning of 1963; (2) net values of these assets at the beginning of 1963 (gross less accumulated depreciation); (3) capital expenditures in 1963; (4) expenditures for other acquisitions of assets; (5) depreciation, depletion, and amortization during 1963; and (6) other



deductions for fixed assets; and, finally, (7) a calculated net value at the end of 1963. The establishment information was to be collected on form MA-100 which is sent to the 60,000 establishments sampled in the annual survey of manufacturers and that on the company, on form NC-K1, "Company Summary Form" sent to the 10,000 largest industrial and business firms.

When the 1963 establishment Form MA-100, Annual Survey of Manufactures, was submitted for approval with this asset inquiry as well as a rental inquiry on buildings and equipment, industry spokesmen maintained that many of the larger companies could no longer provide reliable figures on depreciation reserves at the establishment level. The recent modification of the tax regulations has encouraged companies to establish depreciation reserves for broad asset groups. Many concerns have chosen to do this only at the company rather than at the plant level. Thus, it is no longer necessary for the companies to maintain depreciation reserve accounts for establishments. It was felt that attempts to prorate depreciation chargeable at the company level to individual plants could produce unrealistic results.

Further, industry spokesmen felt that the tax allowances for depreciation were becoming unrealistically far removed from the economic concept of depreciation, apparently despite the fact that the new guidelines were adopted to bring the two closer together. Any net value derived after depreciation at rates allowable under the tax laws, would not be a meaningful measure of residual economic value. They agreed that the companies could report reliable gross book value for the plant and equipment at each establishment without significant difficulty. As a result, the annual survey of manufactures inquiry is confined to a single line requesting data on gross book value of depreciable (only) assets as of the end of 1962 and the end of 1963.

However, Form NC-K1: Company Summary Form was approved substantially as submitted. Thus, in the 1963 censuses, approximately 10,000 of the largest industrial and business firms (accounting for over one-half of all employment reported by the 3 million firms in these census-covered sectors) will be asked to report the following company aggregates: gross (book) value and net (depreciated) value of depreciable and depletable fixed assets, as of the beginning of 1963. Each of the various components of change during the year in these fixed assets will also be requested—capital expenditures for plant and equipment, *plus* other acquisitions (due to mergers, etc.); *less* depreciation and depletion charges; *less* other deductions (assets sold, retired, scrapped, etc.).

Finally, a 1963 yearend summary of total company assets will be requested, with a breakdown showing the net value of depreciable and depletable assets, all other domestic assets, and all foreign assets.

The census of manufactures and annual survey of manufactures contain figures on inventories by stage of fabrication and capital expenditures at manufacturing establishments for many years. Because of the length of the capital expenditures series, which provide estimates both on an industry and geographic basis, they have been used to estimate stocks of capital at various times using the perpetual inventory method.

Selective figures on the stock of specific types of capital equipment are also available. Figures on the value of production (and quantity in census years) of various classes of capital equipment are available from the annual survey of manufacturers. Figures on machinery in place are also available in census years for some industries such as textiles, and oilseed crushing equipment. Detailed figures on trucks and tractors were collected in 1947. In 1954 and also in 1962, figures on horsepower rating by industry are available.

In the 1957 Annual Survey of Manufacturers information on rental payments was collected. A single entry appeared on form MC-D11 requesting total rents paid for buildings and machinery. These data were published in the same industry and regional detail used to show the breakdown of depreciable assets.

When a similar question on rents paid was planned for the 1963 survey it was pointed out that many companies rent buildings and equipment centrally and assess a charge against plant operations. The rental inquiry on the establishment report has been retained however, with modification that where the rental account was handled separately, the plant should report the estimated share of the central rental payments or the equivalent overhead or service charges assessed by the company.

Also, rental payments data will be collected for the entire company, distinguishing between those paid for use of buildings and structures and those for rented machinery and equipment.

#### *Internal Revenue data*

The most comprehensive single organized source of basic accounting records on the book value of fixed assets, depreciated and undepreciated, covering all industries in the private business sector, is the Federal annual income tax return filed with the Internal Revenue Service by all active business firms.

From corporation tax returns, the balance sheet schedule provides summary information on inventories, land, depreciable and depletable assets, and their accumulated reserves, while the income and expense statement provides data on depreciation, depletion, and accelerated amortization charges for the year, property losses, rental payments, and rents received. In addition, the supporting depreciation schedule (schedule G) generally includes information on each of the groupings or classes of property accounts listed by the company (i.e., original cost, additions and retirements during the year, accumulated and current depreciation charges, method of computation, and useful life of the asset class).

Published annually, these data are broken down by two-digit IRS industries which conform closely to SIC industries. Companies are classified into the IRS classes based on their largest receipts category. Even if the IRS used SIC classes strictly, totals for the same SIC class would differ because IRS is classifying returns from firms, as defined for tax purposes, by primary industry while census is classifying each establishment. Beginning with 1963 data, IRS has shifted to the industry classification used by the Securities and Exchange Commission.

In "Statistics of Income for 1959-60," IRS allocated the gross de-

preciable assets of firms classified by primary industry among the actual two-digit IRS industries in which they were used. This was done for a sample of large firms whose gross depreciable assets were 52 percent of the total published for tax years ending July 1959-June 1960.

The IRS also tabulates the data described above for its three-digit industries. Though not published, these tabulations are available from the IRS source book maintained in the Washington office and available on microfilms to qualified investigators.

Data on gross and net depreciable and depletable assets at the IRS two-digit level are also distributed by asset and receipt size.

Similar if slightly less detailed information is obtained on partnership returns. Sole proprietorships, while not required to prepare a balance sheet, do provide data on business property losses, inventories, and depreciation and depletion charges, as well as supporting depreciation schedules.

These balance sheet and income and expense statements are used to develop the fairly detailed estimates shown in the IRS "Statistics of Income" series. The latest available estimates are based on a stratified sample of about 110,000 sole proprietorship returns, 35,000 partnership returns, and 170,000 corporate returns, including *all* large business firms in the 3 categories (i.e., all above specified minimum dollar amounts of sales and receipts, net income, and total assets).

Summary tables of the depreciation methods used by corporations also appear in the corporation income tax returns—"Statistics of Income for 1959-60." In addition, more detailed information on depreciation is available as a result of three studies designed to appraise asset lives for depreciation purposes established in 1942 in Bulletin F.

The first of these is the "Life of Depreciable Assets Study," conducted by the IRS and available in the source book cited above. The study was based on a sample of 1959-60 tax returns for about 55,000 corporations (derived from the "Statistics of Income" sample). Detailed information was extracted from the depreciation schedule in each tax return for each asset class listed, including the asset type, the year of acquisition, and the depreciation method used. The results were cross tabulated in detail, by 60 major industry groups, 200 asset types, 6 depreciation methods, and by period of acquisition—pre-1954 and post-1953.

The Treasury conducted a study using a smaller sample—2,000 returns—covering 58 percent of total assets, compared with 71 percent in the IRS study. The information was collected by questionnaires sent to respondents rather than from the tax return depreciation schedules. Detail was similar to that in the IRS study.

The third was a series of field-conducted engineering surveys of current and prospective technological developments in seven important industries: Textiles, aircraft, automobiles, electrical machinery and equipment, machine tools, railroads, and steel. The results of the three studies were used in developing the "IRS Depreciation Guidelines and Rules," issued in 1962 to replace the 1942 Bulletin F as a guide to depreciation allowances.

Data on rents paid are available for corporations, partnerships, and sole proprietorships. The totals are not all inclusive, however, since some rental payments are combined with cost of goods sold. Rental income is available for partnerships and corporations only. "Rents paid" appears to include all business properties leased, such as computer equipment. "Rents received" appears to cover only that portion of rents accruing from the leasing of assets which are not the primary product of each company. Thus, rents paid to IBM, for example, are available, but IBM's business receipts include those received for both the sale and rental of equipment.

QUARTERLY FINANCIAL REPORT FOR MANUFACTURING CORPORATIONS,  
SEC-FTC

Since 1947 the Federal Trade Commission and Securities and Exchange Commission have been publishing balance sheet and income statement data for manufacturing corporations. For tangible assets the usual balance sheet aggregates—land, depreciable and depletable fixed assets and inventories—appear. The data are based on a sample drawn from balance sheets of firms filing income tax return 1120 with IRS. Seven percent of the firms filing these returns are included in the sample. These firms have about 86 percent of manufacturers' assets.

Companies, based on the total-enterprise concept rather than the company as defined for tax purposes, are classified according to the Standard Industrial Classification. Data are published in two-digit detail, with some supplementary industries such as iron and steel and primary nonferrous metals shown separately.

WEALTH DATA FROM NONGOVERNMENT SOURCES

Trade associations and publications generate considerable data on the physical stocks of tangible assets and information related to them. Trade association data are largely physical counts of production equipment, sometimes accompanied by estimates of the physical output such equipment could produce if operated at "capacity." Examples of trade association data on wealth are provided by the published reports of the American Iron & Steel Institute and the American Pulp & Paper Association.

The American Iron & Steel Institute published information until 1960 on the number and capacity of coke ovens, blast furnaces, and steelmaking furnaces. Detail was provided on the location of each facility and the owning company.

The American Pulp & Paper Association publishes data on capacity for paper, paperboard, building paper and board, and wet machine board. In a recent publication the association presented survey data on capacity in the industry—actual and projected—for the 1962–66 period. Capacity is rated on both a “historical” and “maximum or all-out” basis. The former assumes that a normal working year has 310 (paper) or 313 (paperboard) days; the latter is based on operations for the entire year excluding union holidays and repair shutdown time. For 1962–66, data are also reported on the number of new machines and improvements, actual and anticipated, measured in output units. The industry is broken down into 19 subgroups.

American Machinist magazine, a trade publication of McGraw-Hill, conducts an inventory of metalworking equipment every 5 years. Detailed breakdowns of 167 machine and equipment types for 24 geographical areas and 44 using industries are given. Age categories—less than 10 years old, 10 to 20 years old, and over 20 years old—are also reported. For the 1963 survey, questionnaires were sent to 34,000 metalworking plants; 7,370 responses were received.

The McGraw-Hill survey of anticipated plant and equipment expenditures generally provides data on investment flows only. Sometimes questions on the type of the investment such as replacement and modernization or expansion for buildings, motor vehicles, and machinery and equipment, and on capacity, utilized capacity, and age of installed capacity are included.

In addition to the sources mentioned above there are other trade organizations and publications which collect selected physical measures of plant and equipment and capacity. Time has not permitted a complete survey of these private data sources, however.

#### WEALTH ESTIMATES FOR THE MANUFACTURING SECTOR

Capital stock estimates have been made for manufacturing and in conjunction with broader measures of capital for the economy as a whole. A summary of these estimates appears in table I which is reprinted from a preliminary monograph prepared by Patrick Huntley of the Business and Defense Services Administration, Department of Commerce. The work of Daniel Creamer, “Capital and Output Trends in Manufacturing Industries” (NBER Occasional Paper No. 41, 1954), that of Creamer, Dobrovolsky, and Borenstein, “Capital in Manufacturing and Mining, Its Formation and Financing” (Princeton, 1960), and that of Jaszi, Wasson, and Grose, “Expansion of Fixed Business Capital in the United States,” Survey of Current Business, November 1962, are illustrative of two different approaches to estimating capital stocks, enumeration, and perpetual inventory.

TABLE 1.—Summarized features distinguishing BDSA estimates of manufacturers' stocks of depreciable capital assets from alternative estimates

Item	BDSA series in present study (by Huntley)	Census Bureau estimates from special survey	OBE from special project (by Wasson)	NBER (Creamer's estimates)	NBER (Goldsmith's estimates)	NICB (discontinued series)	Huntley's estimates from his doctoral dissertation
Date of publication.....	Forthcoming: 1964.	1961.....	1962.....	1960.....	1962.....	1938.....	1960.
Universe covered.....	Establishments in contiguous continental United States.	Establishments in contiguous continental United States.	Companies in the United States.	Companies in the United States.	Industrial companies <sup>1</sup> in the United States.	Industrial companies <sup>1</sup> in the United States.	Establishments in contiguous continental United States.
Depreciable assets series.....	Plant and equipment, <sup>2</sup> machinery and equipment.	Plant and equipment, machinery and equipment, and structures.	Plant and equipment, machinery and equipment, and structures.	Fixed assets <sup>3</sup> .....	Plant and equipment, <sup>3</sup> machinery and equipment, and structures.	Equipment and tools.....	Plant and equipment.
Time covered.....	1947-62 (both series).	1957 (all sets).....	1928-61 (all series).....	1890, 1900, 1904, 1929, 1937, 1948, 1953. <sup>4</sup>	1945-54 (M. & E.), 1945-58 (structures).	1931-37.....	1954-56.
Cross-sectional detail.....	State distribution, industry groups at 3-digit level per 1957 SIC code. <sup>5</sup>	State distribution, industry groups at 3-digit level <sup>6</sup> per 1945 SIC code. <sup>5</sup>	None.....	Industry groups at 2-digit level <sup>6</sup> per 1945 SIC code. <sup>5</sup>	None.....	None.....	State distribution, industry groups at 2-digit level per 1945 SIC code. <sup>5</sup>
Methodology of estimate.....	Perpetual inventory. <sup>7</sup>	Physical inventory. <sup>7</sup>	Perpetual inventory.	Physical inventory. <sup>7</sup>	Perpetual inventory.	Physical inventory. <sup>7</sup>	Perpetual inventory.
Sources of data.....	Expenditures principally from Census Bureau.	Direct query in special survey.	Collected from various governmental sources.	1929 forward—Internal Revenue Service; prior 1929—Census Bureau.	Departments of Commerce and Labor.	Internal Revenue Service and Moody's Investment Manuals.	Expenditures principally from Census Bureau.
Depreciation schematic.....	Linear.....	Not applicable.....	Linear (exponential and quadratic available).	Not applicable.....	Linear.....	Not applicable.....	Linear and quadratic.
Basis of useful life of assets.....	Statistical estimate. <sup>8</sup>	.....do.....	Statistical estimate. <sup>8</sup>	.....do.....	Assumed <sup>8</sup> .....	.....do.....	Statistical estimate. <sup>8</sup>
Magnitude relative to BDSA estimate.	.....	Virtually the same.	P. & E. greater, M. & E. greater, and structures virtually the same.	Greater (even after adjustment for incomparability).	M. & E. much greater, structures virtually the same.	Nearly the same..	Slightly lesser.

Valuation base: net stock-----	Historical cost-----	No estimate-----	Historical cost, constant cost, and current cost.	Historical cost, constant cost.	Historical cost and constant cost.	Historical cost-----	Historical cost and constant cost.
Gross stock-----	do-----	Historical cost-----	do-----	No estimate-----	No estimate-----	No estimate-----	No estimate.
Price index-----	Not applicable-----	Not applicable-----	Internally developed. <sup>1</sup>	Self developed <sup>2</sup> -----	Departments of of Commerce and Labor.	Not applicable-----	Machinery and Allied Products Institute.

<sup>1</sup> Industrial companies' universe is principally manufacturing companies, but mining companies and perhaps some trade and service companies are included. See textural discussion.

<sup>2</sup> Structures (also called *plant*) were not estimated directly in the Huntley work but can be obtained by subtraction of machinery and equipment from plant and equipment. Such operation was performed for some industries in the text. Similarly, the Goldsmith estimates lack plant and equipment which can be obtained by addition of the components.

<sup>3</sup> Creamer's fixed assets include land and depletable assets.

<sup>4</sup> Creamer has updated these estimates in 2 later publications of the National Industrial Conference Board: "Studies in Business Economics" Nos. 72 and 79. The latter, entitled "Recent Changes in Manufacturing Capacity," includes 1961 figures.

<sup>5</sup> Bureau of the Budget, "Standard Industrial Classification Manual," 1957 issue differs from 1945 classification at 2- and 3-digit levels.

<sup>6</sup> Bureau of the Census has available some 4-digit industry estimates; Creamer's estimates include some 3-digit industrial groupings but not all 2-digit groups are estimated separately.

<sup>7</sup> Physical inventory ordinarily means a directly observable count, but in this case it is given modified meaning: the Census Bureau queried establishments for the "count" and Creamer, in one instance, NICB in another, used Internal Revenue Service balance sheet statistics which obtain from companies' records. In both latter instances adjustments were made to include noncorporate companies. In discussion with the author Mr.

Creamer objected to classification of his methodology as physical inventory, insisting that it is a balance sheet approach. Huntley's response is that this is a moot point, for conceptually from the researcher's viewpoint statistics obtained from a summation of companies' balance sheets are tantamount to a count of values being given to him.

<sup>8</sup> The statistical estimate of this study and that of Office of Business Economics were obtained by quite different methodology although their source is fundamentally the same, i.e., the Internal Revenue Service; see textural discussion. Goldsmith's composite life estimate also is from Internal Revenue Service although it lacks statistical procedure involving weighting of classes of assets.

<sup>9</sup> The Office of Business Economics draws upon other governmental agencies and non-Government sources to piece together a price index for machinery and equipment and a separate index for structures. Its structures index and the one used by Creamer for recent years are based on Turners Construction Index. Creamer's index on structures covering earlier years is developed from unpublished worksheets of Simon Kuznets and Raymond W. Goldsmith; similarly he built up an index on machinery and equipment using several sources: Simon Kuznets, William H. Shaw, and Lowell D. Chawner—but see Creamer's app. A.

Source: Patrick Huntley, "Capital Assets: The Wellspring for Economic Growth," preliminary monograph, Business and Defense Services Administration, Department of Commerce.

Creamer et al. used the census of manufactures for benchmark years between 1880 and 1919. For benchmark years from 1919 through 1953, the "Source Book of Statistics of Income" was used. Estimates were made for 11 years of the 1880-1953 period. The census definition of the manufacturing sector was used for the most part. Capital estimates were made for fixed capital (land, buildings, and machinery and equipment) and working capital (cash, inventories, and accounts receivable). These estimates for 1880-1948 are available for each of 41 manufacturing industries, for 1948-53, for 18 manufacturing groupings. The data consist of book value figures net of depreciation adjusted by price indexes based on 1929 prices. In addition, an updating of these data has been published in the "Studies in Business Economics" series (Nos. 72, 79) of the National Industrial Conference Board.

The estimates of Jaszi, Wasson, and Grose were prepared, using the perpetual inventory method. These capital stock estimates, built up from capital expenditures series, covered the structures and equipment located in the United States and owned by U.S. private business (including private ownership of residences), nonprofit institutions, and foreigners. Eight separate service lives were used; future work will employ 40. Since assumptions made about useful lives and depreciation are crucial to the perpetual inventory method, estimates were made using different sets of assumptions. The estimates, in 1954 dollars, were broken down into structures and equipment for the farm, manufacturing, and "other" sectors. Huntley's estimates, referred to in table I, are also based on the perpetual inventory method; these estimates are for three-digit industries and for States.

The estimates of Creamer et al., adjusted when appropriate, have been used as the basis for the capital stock measures employed in the recent NBER studies by Goldsmith, Kendrick, and Kuznets.

### III. EVALUATION OF GROSS BOOK VALUE AND SUPPLEMENTAL DATA REQUIRED TO MAKE WEALTH ESTIMATES

This section discusses the suitability of the available data for wealth estimates. The discussion is broken down into three subsections. The first deals with book value figures, the second with the revaluation of such data to gross current day values, and the third, with the calculation of depreciation necessary to obtain net stock estimates. Another subsection deals with problems of estimating manufacturing wealth by industry of use, i.e., the adjustment necessary to take account of leased assets.

#### GROSS BOOK VALUE DATA

The gross book value data collected by census in the annual survey of manufactures have the attribute of being collected by establishment. Such data can be more precisely allocated among four-digit industries and can be presented in geographical area detail, as is currently done in census reports. IRS company data cannot be allocated as meaningfully among industries; IRS attempts only a three-digit breakdown. Geographical breakdowns are not possible with IRS data.

As presently collected, there are some problems associated with the use of census data on gross book value.



*Problems of coverage*

The gross book value figures fail to reflect fully the underlying physical assets for several reasons. First, these data do not reflect asset purchases which are expensed. While expensing certain items is a correct procedure for tax purposes, the result may be at variance with the economist's definition of fixed capital. ORE currently estimates investment charged to current account in preparing its gross national product accounts.

The second problem is that book value figures include items bought second hand, either directly or through mergers and acquisitions. Thus, the data are not consistent throughout the economy and are influenced by the volume of used equipment transactions. Capital expenditures data, which appear in the 1958 Census of Manufactures, broken down into outlays for new and used plant and equipment, indicate that this problem is important only in selected industries. The major industry groups with relatively high ratios of used to new equipment outlay in 1958 were textile mill products, transportation equipment, leather and leather products, and electrical machinery.

A third problem is that the data for establishments collected in the annual survey are limited to manufacturing establishments and thus exclude the tangible assets of central administrative offices and auxiliaries. These tangibles will be included in the 1963 company summary form referred to above. Selected data, other than those on tangible assets have been collected by the Census Bureau for central accounting offices and auxiliaries and published in Enterprise Statistics. Figures found there indicate that, in 1958, 4 percent of the employment of manufacturing firms (excluding sales personnel) was located at central offices and auxiliaries.

Finally, census data exclude manufacturers' land. Book values for land are shown, however, in the IRS tabulations. The problem is to link the IRS company data to census establishment information. Progress made on linking the two sources is discussed below.

*Issues in presenting detail by industry and geographic area*

The census data on gross depreciable assets are presented in four-digit industry detail which is the finest level of detail in the collection of establishment-wide statistics. There are two major issues in classifying tangible assets by four-digit industry. The first is that establishments are classified by primary activity. Thus, the assets used to extract minerals from the earth would be included in the manufacturing sector if manufacturing activities were carried on at the mine site and represented the primary activity of the total establishment. Published product specialization ratios gauge the extent of this problem in each industry. A second problem is that data being collected on the tangible assets of central offices and auxiliaries cannot, and probably should not be, allocated where the central office services establishments in more than one four-digit industry.

The census data on gross assets (depreciable and depletable) were published in two-digit detail at the State level. However, data in the annual survey of manufactures are presented in three-digit detail for most States and in two-digit detail for many standard metropolitan statistical areas. This latter degree of detail would be preferable for gross book value data.

The current geographical distribution used for central offices and auxiliaries is limited. The regional breakdown of employment data by State and selected SMSA's is published in Enterprise Statistics for manufacturing as a whole. There is no detail by industry or type of facility such as is provided for the national totals.

#### *Asset-type detail*

The only source of detail by asset type is that for tax year 1959-60 tabulated by the IRS and the Treasury in connection with the studies of useful lives for purposes of revising depreciation rates (see under II, above). The IRS is its "Life of Depreciable Assets Study" used 200 asset-type categories but not all of these were tabulated. The categories were obtained from among those reported by corporations in explaining their depreciation deductions. However, with the adoption of the new "Depreciation Guidelines and Rules" by the IRS, taxpayers will only be required to report the following asset classes appropriate for manufacturing:

- (1) Office furniture, fixtures, machines and equipment.
- (2) Transportation equipment (various major types).
- (3) Land improvements other than buildings.
- (4) Buildings (various types)
- (5) Manufacturing equipment aggregated over all types of equipment for each of the 30 subindustries.

Thus, except for a few structure and equipment classes, detail will be presented by industry rather than type.

The Office of Business Economics used the IRS equipment-type tabulations to check their own capital stock estimates for 19 classes based on commodity flow data. For many categories, the IRS totals were under the OBE estimates; however, the reverse was true for the category, "general industrial equipment." This finding reflects, at least in part, the fact that in tax reports respondents were inclined to put more equipment into the "general industrial equipment" class than did OBE, using commodity flow data.

Asset-type detail is important as such in estimating market demand, and in revaluing gross book figures. Its importance for the latter purpose will be discussed in the next section.

#### THE INFORMATION REQUIRED TO REVALUE GROSS BOOK DATA TO CURRENT DAY PRICES

In order to achieve consistency over time and cross sectionally in the historical cost data which reflect assets acquired at different market prices, it is necessary to revalue the assets to take account of price changes. This can be achieved by "reflating" the book value data for each asset class, distributed by age group, by the appropriate price index. This procedure requires three basic ingredients: (1) Information by asset type; (2) an age distribution of each of these asset-type classes; and (3) price indexes for each asset type. Each of these three ingredients will be discussed in turn.

#### *Asset-type detail*

Book data by asset type, reflecting categories in which there have been different price movements, are needed. For the 19 producers' durable goods categories for which the Office of Business Economics

maintains capital stock estimates, price increases through 1962, based on 1954, ranged from 4 to 35 percent. Undoubtedly, a different structuring of equipment categories would yield a different range of price increases. Thus, it is apparent that the theoretically ideal equipment classification would be one which would break equipment down into classes, each of which was associated with a particular price trend. However, classes established in this fashion would probably not be suitable for all of the other uses of asset-type detail. Some classes would have to be combined and weighted; i.e., composite price indexes used.

#### *Asset-age detail*

Once the asset-type categories were established, the next step would be to classify the assets in each category by age. An age distribution of each class of equipment is, of course, needed so that the price index appropriate for each year can be applied. To group each equipment type by year of acquisition would entail an extremely large volume of work in collecting and processing data. Rather, it would seem more practicable to array each asset class by groups of years of acquisition. Age class intervals should be constructed with the end in mind of minimizing the errors due to what is essentially an averaging process; i.e., reflating the dollar outlays for a group of assets acquired, for example, during a 5-year period by an average price index for the same period based on the current year. Price changes themselves could serve as a guide to the delineation of periods. The determination of the actual age class intervals would require more intensive study. It would probably be more practicable to collect these asset-class data, arrayed by groups of years, from a sample of firms rather than on a census basis.

An alternative approach to getting an age distribution from a sample of firms would be to use existing commodity flow data as a guide. To do this would require, as in the perpetual inventory method, that retirements were always of the oldest vintage. This assumption is probably not met to a great extent in the real world, especially in industries experiencing rapid technological change. But if it did not prove feasible to collect asset data, by type, by age, an "analytical" approach to reflating book value would have to be considered.

#### *Price indexes*

The general topic of price indexes for revaluation is discussed in the Wealth Study staff report and appendix I, part J. The problems discussed below and others are considered there in greater detail.

A price index is needed for each equipment class. When revaluation to current replacement cost is desired, the index must be based on the current year. The index should cover a period of time equal to the age of the oldest tangible asset to be revalued. The price indexes required for revaluation fall into three main categories; those for use in revaluing land, for structures, and for equipment.

No indexes for valuing nonfarm land currently exist. Ideally, such indexes should be constructed for each major type of land—site, productive, vacant, etc. There should also be regional indexes by standard metropolitan statistical areas. An alternative though less desirable method would be to multiply acreage data by appropriate current price estimates for different types of land in different geographical areas.

For structures there are currently available construction price indexes computed by Government agencies and private concerns. Some of these indexes have been criticized because input rather than output prices have been used. This methodology fails to take into account changes in input productivity.

The Bureau of Labor Statistics publishes capital goods price indexes. A major problem is that these price indexes do not cover some types of capital equipment, due largely to the infrequency of transactions for many of them.

#### DEPRECIATED REPLACEMENT COST—DEPRECIATION ESTIMATES

The decline in value of tangible assets over time leads to the necessity of estimating depreciation so that the gross book value data can be revalued to a net basis. Depreciation can be calculated by multiplying the original cost data, reflatd to replacement cost, by some ratio of age to useful life. The exact ratio used depends on the assumptions made about the way in which an asset declines in value over time; i.e., constant amount per year, constant percentage per year, etc. An alternative to this approach would be to collect data on secondhand prices which the depreciated replacement cost estimates attempt to approximate. Since secondhand prices are not available for many important types of manufacturers' tangible capital, depreciated replacement cost estimates are more feasible. Gross replacement cost estimates were discussed above; in this section the focus is on the calculation of depreciation necessary to arrive at net stocks at replacement cost.

In order to estimate depreciation, four bodies of data or information are needed: (1) Asset-type detail; (2) age of asset; (3) useful life of asset; and (4) the way in which the asset declines in value over time.

Two essentials—asset type and age—have been discussed above. They enter, also, into the computation of depreciation. Different types of equipment may have substantially different useful lives. It is necessary to separate the data into asset-type groups reflecting different useful lives so that separate depreciation rates, based on these useful lives, can be applied appropriately. The asset-type detail problem is similar to that discussed above in connection with price indexes. Thus, asset-type detail requirements vary depending on the point of view—asset-type detail for its own sake in assessing market demand for different classes of equipment, for use in reflatng gross book value data to replacement cost, and for facilitating the estimation of depreciation. The determination of the actual detail obtained must rest on a consideration of these three needs and the availability of the detail from respondents.

The most recent information on useful lives resulted from studies which led to the new guideline lives adopted by the IRS for tax purposes. The IRS "Life of Depreciable Assets Study" and a similar one conducted by the Treasury are discussed above. These studies attempted to determine the extent to which companies were using lengths of life different from those established in 1942 in Bulletin F. To depart from Bulletin F lives would have required that the firms justify the change to IRS. It cannot be concluded that these "negotiated lives" would coincide with "economic lives."

In their article which appeared in the November 1962 Survey of Current Business, Jaszi, Wasson, and Grose used both Bulletin F lives and 20-percent shorter lives in deriving their commodity flow-based estimates of fixed business capital. The net stock estimates for the end of 1961, under the assumption of straight line depreciation, were \$366 billion (constant 1954 dollars) based on Bulletin F lives, and \$301 billion—or 18 percent less—based on lives 20-percent shorter. This finding highlights the importance of the useful life assumption in determining the level of capital stock. It underscores the need for additional studies to get useful “economic” life estimates rather than those based on negotiations between firms and the IRS.

Akin to the problem of deriving useful life estimates is that of determining the way in which the value of an asset declines over its useful life. The Survey of Current Business article presents net stock estimates under both the assumptions of “straight line” decline and “double declining balance.” The latter method is based on the assumption that the absolute decline in the value of an asset is greatest in the years just after its acquisition; the former assumes a constant absolute decline in value over time. Net stocks at the end of 1961 based on straight-line depreciation totaled \$366 billion (constant 1954 dollars), based on double declining balance, \$297 billion or 19 percent less. This example indicates the difference in estimates which can arise as a result of the assumptions made about the actual depreciation curve to be used.

Studies are needed to determine the appropriate depreciation curves, which probably differ among equipment types. More analytical work as well as field studies are called for. An analytical approach which should be explored further is the use of series on secondhand prices for different equipment types as a guide to the way in which each type declines in value over time.

An alternative, though less desirable approach, is to collect data on depreciation reserves and to reflate these data on the same basis as the corresponding gross book value data. The reflated depreciation reserves could then be subtracted from the reflated gross book value data to arrive at depreciated replacement cost estimates. There are two major undesirable features of this approach. One is conceptual, the other, a data collection problem; both have been elaborated in the section on depreciation. First, the approach assumes that depreciation reserves are based on economic, rather than “negotiated” lives and that the selection of the depreciation method by the company is based on the actual life curve rather than tax considerations. Second, with the adoption of the new IRS depreciation guidelines, data on depreciation reserves may not be obtainable at the establishment level, or in sufficient detail at the company level.

#### DATA ON OTHER ASSETS

##### *Land*

Aggregate data on the book value of land are available from IRS, broken down by IRS three-digit industry and firm size (based on both receipts and total assets). There is no available breakdown by use—site land, productive land, or vacant land.

For revaluation, much additional information is needed on land prices. Price indexes would be highly desirable so that the mixture

of historical costs embedded in land accounts could be put on a consistent basis.

As an alternative, current land prices, per acre, could be applied to data collected on acreage. For the manufacturing sector, little data on acreage is available. Some information has been developed in "land use" studies for selected regions.

### *Inventories*

The value of beginning and end of year inventories is collected in the census of manufactures and end of year inventories, in the annual survey of manufactures. Separate inventory figures are collected for each stage of fabrication—finished products, work in process, and materials, supplies, fuel, and other inventories. These are published in four-digit detail.

According to the census of manufactures, "respondents were asked to report their inventories at approximate current costs if feasible; otherwise at book values." Because of this the dollar inventory figures reflect a mixture of valuation methods—market price, FIFO and LIFO. The former is the most desirable method for purposes of the wealth inventory. The error introduced by the inclusion of FIFO-valued stocks may not be too large. With this method, the items remaining in inventory are of the most recent vintage and their associated prices may be close to current market. For LIFO-based inventory valuation, the problem is more serious. The items in the year-end holdings are of the oldest vintage and their prices are less likely to reflect the current market. This problem is inherent despite the rate of inventory turnover and would only cease if a firm completely liquidated its inventory before reordering.

### ASSET LEASING

The significant increase in the leasing of plant and equipment compels the presentation of wealth estimates on both an "industry of ownership" and "industry of use" basis. To enable the transition from the former to the latter, information on leased plant and equipment is necessary.

IRS data mirror the sharp advance in rental payments, although they cannot be used for strict comparisons because of inconsistencies. Manufacturing corporations reported, for the 1947-48 tax year, rental payments of \$675 million. For 1960-61, latest information available, rental payments of \$2,370 million were reported, an increase of 251 percent from 1947-48. When these totals for rental payments are adjusted for the number of firms filing returns in each of the 2 tax years, the resultant increase, which reflects the rise in the importance of rental payments to the individual firms, is 137 percent. Part of the increase is due to rising prices. No suitable price index is available to deflate rental payments. The implicit GNP deflator, a possible gauge, rose 38 percent from 1947 to 1960, a small advance compared to percentage changes in rental payments, and rental payments per firm.

In a supplemental inquiry for 1957 to the 1958 Census of Manufactures, a sample of manufacturing firms was requested to supply data on rents paid by all their establishments. These data totaled \$1,411 million for the manufacturing sector in 1957. If these rental payments

were capitalized at 10 percent, in order to derive a proxy for the gross book value of leased assets, the capitalized value would be \$14.1 billion, 13 percent of the gross book value of depreciable and depletable assets as of the end of 1957. (The gross book value data were collected along with rental payments from the same sample of firms; these are described above in II.) The 13-percent figure is a measure of the importance of leased assets in the manufacturing sector. Of course, part of the rental total represents intraindustry leasing. However, it is still relevant when four-digit manufacturing detail is considered.

In order to make the transition from an "industry of ownership" to "industry of use" basis, data on the gross book value of leased assets are required. It would be impracticable to ask such information of the lessees who use these assets. (Perhaps some lessees would know the purchase prices of assets they were leasing since presumably at some point they compared them to leasing costs in deciding to lease.) Rather, lessors would have to be asked to report the gross book value of leased assets and the rents received from leasing them. From these data, broken down by asset type, a capitalization rate could be established for each major type of leased equipment. For consistency these equipment classes should be the same as those used in collecting data on an industry of ownership basis. These capitalization rates could then be applied to the data on rentals paid, broken down into the same equipment classes.

The foregoing methodology obviously calls for much more information than is currently collected. The company summary form to be used in 1963 breaks down rental payments into only two categories—buildings and structures, and machinery and equipment. Data on rents received are, also, inadequate. The only current source, IRS, tabulates the tax form line item, rents received. There is no indication of what is included in the figure, but it does not include the revenue received from manufacturing firms whose sales take the form of leasing contracts.

#### IV. RECOMMENDATIONS

The Working Group on Manufacturing Wealth commends the effort of the Industry Division of the Bureau of Census for the excellent framework which it has provided for the collection of wealth data. The census of manufactures and the annual survey of manufactures should be used to the greatest extent possible, both to provide, as in the past, the book value data at the core of the wealth estimates and as a vehicle, whenever appropriate, for obtaining additional information in the detail necessary to produce the estimates in their final form.

The group recognizes the ultimate need for data on the wealth of the manufacturing sector, valued at prices reflecting the current market. For reproducible assets, replacement cost less depreciation seems to be the best approximation to current value. To arrive at such estimates three steps are involved: (1) The collection of data on the gross book value of reproducible assets from manufacturing establishments; (2) the revaluation of such data by the application of appropriate price indexes to an age distribution of these gross book value figures; and (3) the calculation of depreciation by multiplying the gross book values at replacement cost by ratios reflecting the ages and useful lives of the assets and the way in which they lose value over time.

Step 1 is a data collection problem to be handled by the Census Bureau. Steps 2 and 3 involve analytical work conducted by an agency processing wealth data and preparing wealth estimates. Some of the information needed to carry out steps 2 and 3 could appropriately be collected by the Census Bureau in conjunction with its collection of the book value data.

#### GROSS BOOK VALUE DATA

The first step in the wealth estimation process is the collection of gross book value data. The census of manufactures and the annual survey of manufactures are the appropriate vehicles for collecting this information.

#### *Scope, gaps, and overlaps*

The working group recommends the use of the census of manufactures' coverage of the manufacturing sector, which employs classifications established in the Standard Industrial Classification Manual as most recently revised. For the purposes of the census of manufactures the manufacturing sector is composed of SIC major groups 19 through 39.

The collection of data on an establishment basis, as is currently done by the Census Bureau for many industries, poses problems. However, where the establishment basis of collecting statistics is employed, the data so obtained are of greater use in productivity and other analyses. The concept of manufacturing industries of establishments as the basic building blocks for wealth data should be maintained. Totals, as currently collected, for industries of establishments will, of course, differ from those for industries of companies. The problem of reconciling company and establishment data is being studied in the "Census-IRS link project." The identification of the establishments of a company is necessary as a means of linking data on tangible wealth collected from establishments with those on financial and central office tangible assets which can only appropriately be collected at the company level. Such identification also provides a necessary check on the comprehensiveness of the tangible wealth estimates. Existent gaps can be found and closed if the establishments of a company can be identified and the total of their tangible wealth can be compared to the total reported by the company as a whole. These problems underscore the need to continue the "link project."

The establishment reporting system used currently to collect tangible asset data needs to be extended to central administrative offices and auxiliaries. The rising trend toward centralization of many manufacturing functions should lead to continual increases in the percentage of manufacturers' tangible wealth located in central offices and auxiliaries. It would be useful to obtain tangible asset data for central offices by the same categories used in Enterprise Statistics: (1) Central administrative offices; (2) research, development, or testing; (3) storage (warehouse); (4) all other functions.

Care should be taken to be certain that the book value figures collected are comprehensive and consistent. Book value data may be difficult to interpret due to the failure of firms to capitalize or expense outlays along lines consistent with an economists' definition of capital. The line between these two possible treatments is difficult to



draw. The fact that it has been drawn by conventions established for tax or other reasons in each industry, and perhaps by each firm, certainly leads to inconsistencies. However, it is doubtful that respondents could provide enough information on their capitalizing-expensing policies to permit adjustments to be made to the book value data they report. If the problem can be handled at all, the solution lies along the path of making adjustments at a more aggregative level, similar to those made by OBE.

Gross book value data collected from establishments include both the original cost of new plant and equipment and the acquisition cost of secondhand plant and equipment. Secondhand assets are found in all industries but are probably important only in some of them. It is necessary to get additional information on them on a sample basis. The respondent could be asked the age and original cost of the secondhand equipment. Alternatively, a method could be established to estimate the original cost of secondhand equipment if the respondent provided only its age, acquisition cost, and approximate date of purchase. A study is needed to determine the approach to be used in coping with this problem in industries in which it is significant.

#### *Detail by industry, region, and asset type*

With respect to industry detail, the establishment reporting system used in the census of manufacturers readily permits the consolidation of data at the four-digit SIC level. There would be no significant saving as a result of presenting data only at higher levels of aggregation. Four-digit detail would increase the analytical usefulness of wealth data. It is the level at which data review is carried out by the Census Bureau. Even if the wealth estimates were presented in only two- or three-digit detail, worksheets with four-digit detail should be available to analysts.

The main obstacles to four-digit detail are problems of disclosure and the allocation of assets, such as those of central offices and auxiliaries, among the industries they service. It is recommended that central offices and auxiliaries be shown separately but broken down to the finest relevant industry detail, probably in the order of the 2½ digit classifications used in Enterprise Statistics.

The collection of geographical detail for establishments by county and city, as is currently done in the census of manufacturers, should be continued. From these data, State and standard metropolitan statistical area figures can be obtained. Even for the sample used in the annual survey of manufacturers, reliable three-digit industry detail is available for most States and two-digit detail for many standard metropolitan statistical areas.

Data on the tangible assets of central offices should be shown separately from those of establishments, but with the same regional detail as that applied to the latter wherever possible. The concept of standard consolidated areas used in Enterprise Statistics is an additional geographical breakdown appropriate for the tangible assets of central offices and auxiliaries.

Data on tangible assets of manufacturers should be collected for the broad categories of land, structures, improvements other than structures, producers' durable goods and inventories. In the manufacturing sector, detail on producers' durable equipment poses the main prob-

lem. Information on structures can be readily classified into major, easily identifiable, categories such as plants and office buildings as defined in the Department of Commerce construction activity reports. With respect to land, a threefold breakdown into site land, productive land, and unimproved land would suffice. The continued collection of inventory data by four-digit industry and stage of fabrication is recommended. Conferences with industry representatives should be held to determine if other inventory detail; such as, a breakdown by commodity for raw materials is desirable and can be obtained.

Additional detail for producers' durable goods would be useful, both for its own sake and for the revaluation of capital to a depreciated replacement cost basis discussed below. Because of the adoption of new depreciation guidelines and rules by the Internal Revenue Service, the desirable amount of asset-type detail may not be obtainable. (The new "guideline" classes are discussed above. Detail by guideline class should be the minimum objective, augmented wherever possible by more detail collected on a sample basis from firms which either continue to keep detailed property records by establishment or do not adopt the guideline classes.

If greater detail proves to be available, the delineation of equipment classes should be governed by several considerations. Attempts to collect too much detail would be quite costly and the problem of classifying a piece of equipment would increase as the number of categories rose. The IRS had to abandon its initial attempt to tabulate each of about 200 equipment categories in its "Life of Depreciable Assets" study. On the other hand, a minimum amount of detail should be obtained so that wealth estimates by asset type could be tied into the producers' durable equipment accounts used in the national accounts, the 1958 Census Classification and the detail used in the interagency input-output model. Detail should also be provided for categories for which other working groups have recommended national totals be obtained, such as transportation and construction equipment.

Categories should be well defined and represent significant equipment classes. Classes which are too general, such as "general industrial equipment," should be avoided since it is difficult to tell what respondents have included in them. When such categories exist, respondents may choose to use them rather than to take the trouble of trying to determine whether their equipment should be included in other, more specific, classes.

While the broad classes of equipment would presumably be uniform across industry lines, further detail on type of equipment probably will vary by industry. For example, a class such as "special industry machinery and equipment" would be composed of different subclasses in each industry.

Subject to these guidelines, conferences with industry representatives and feasibility studies should be undertaken to establish specific asset-type classes. By these means it should also be possible to determine how much asset-type detail can be obtained from the existing records of manufacturing establishments.

Book value data by broad asset-type should be collected by census from all respondents. Asset-type detail (by period of acquisition, see below) could be obtained from a sample of establishments in each industry.

## ESTIMATES OF REPRODUCIBLE FIXED ASSETS AT REPLACEMENT COST

Once the book value data have been collected as indicated by the above discussion, the next step is the revaluation of these data by the agency which is to prepare the wealth estimates. In addition to these gross book value data enumerated by the Census Bureau, the other basic ingredients for revaluation are an age distribution of the assets by type and price indexes for each type. This information would enable the historical cost data to be recast into replacement cost estimates.

*Asset-type detail*

As discussed above, asset-type detail by the new IRS "guideline" categories is the minimum detail to be collected. This detail may prove insufficient for revaluation purposes. Greater detail should be obtained. A feasibility study is needed to assess the possibility of getting additional detail. Such detail is necessary in order to avoid the use of price indexes which are too gross and mask divergent price movements in important components.

*Age of assets*

Information on the age distribution of the gross book value of the assets which comprise the historical cost data, should be obtained on a sample basis for each type of asset. Aside from their use in revaluing gross book value figures, age data can be used in the calculation of depreciation (see below) and as a tool in market demand analysis.

Feasibility studies are necessary to determine the age class intervals to be used. Much depends on the adequacy of corporate records. Even the records of companies which maintain detailed property accounts may be inadequate because they have acquired companies with poor records. On the other hand, at a minimum, it should be possible to obtain an age distribution with intervals reflecting changes in corporate tax laws, but these have probably been too infrequent to provide a sufficiently detailed age distribution. The use of commodity flow data in estimating age should also be explored. Ideally, data on capitalized alterations or improvements to structures and equipment should also be obtained by year or groups of years. The feasibility study should also cover the availability of such information.

*Price indexes for revaluation*

With respect to price indexes for producers' durable equipment, the relevant wholesale price indexes of the Bureau of Labor Statistics and unit value estimates based on census value and quantity data provide fairly broad coverage. Nevertheless, it is recommended that BLS continue to expand its price work in the capital goods field, as urged by the Price Statistics Review Committee, to further narrow existing gaps and to further assess the problem of quality change (see app. I, pt. J). In view of the well-known deficiencies of the available construction cost indexes, it is further recommended that the Commerce Department continue its research into the possibilities of improving these indexes. More specifically, price indexes for structures are needed which reflect changes in productivity of the construction industry.

## DEPRECIATED REPLACEMENT COST ESTIMATES

The final step in arriving at depreciated replacement cost estimates is the calculation of depreciation. A detailed study to determine the useful lives of structure and equipment classes is important and overdue. The approach should be one of an intensive examination of the experience of companies which have been making such studies. This should throw significant light on the problems and methodology in estimating useful life. These studies should examine the changes in useful lives over time and the differences in the useful lives of the same equipment class when employed in different industries. Existing studies of useful life such as those of the IRS and Treasury and those using the commodity flow approach should be evaluated further. Perhaps it may be necessary to use the results of these existing studies, modified where appropriate, for making estimates of depreciation until the results of the special study recommended above can be obtained.

Where markets for used industrial equipment exist, prices of various types of equipment of varying ages should be collected and analyzed in order to determine the appropriate method of depreciation (*viz.*, straight line or declining balance). It might be practicable to expand the detail on used plant and equipment purchases collected in the "Annual Survey of Manufactures."

Data on depreciation reserves should be collected from all firms, and from a sample of establishments when available. These data can be used as a check on the depreciation estimates calculated through the use of information collected on useful lives.

It is also suggested that a sample of respondents be asked to estimate the depreciated replacement cost or market value of their tangible assets if it is found that enough firms can do this. This, too, could serve as a check against the value figures calculated by the agency ultimately responsible for wealth estimates. Care needs to be taken in assessing the responses before they can be given weight in checking the wealth estimates.

## VALUATION OF OTHER ASSETS

*Land*

As indicated above, the book value of land should be obtained from the respondents separately from structures, and then converted to current-day values. For this operation, regional price indexes of land are essential. Since no nonfarm land price indexes are now available, the recommendation of the Price Statistics Review Committee that the appropriate Federal statistical agency should be provided resources to commence the compilation of land price or value data and prepare indexes based thereon for major standard metropolitan statistical areas should be underscored.

*Inventories*

Data on inventories should be collected on the same basis as is currently done by the Census Bureau. Four-digit industry detail and detail by stage of fabrication—raw materials, goods in process, and finished goods—are useful breakdowns.

For valuation purposes data on the commodity composition of inventories, particularly for raw material inputs and the age of stocks, should be obtained. Information on age should be collected from both firms using LIFO and those using other methods of inventory valua-

tion. It is of particular importance in estimating the current value of LIFO-based stocks and other than LIFO-based stock changes. In addition it would be useful to obtain from some respondents their own estimate of the current replacement or market value of their inventory holdings, particularly those on a LIFO basis. It is the opinion of the working group that all of the data necessary to revalue inventories should be collected on a sample basis.

#### LEASED ASSETS

Structures and equipment leased "in" are an important source of capital input in the manufacturing sector. It is recommended that leased assets be identified so that wealth estimates may be presented both by industry of ownership and industry of use. Care should be taken to avoid double counting.

In order to do this the Census Bureau should obtain a broad breakdown by type of asset of the rental payment data collected in the annual survey of manufactures. For the same asset-type classes, data on rents received and the book value of assets leased to others should be collected. With this information it would be possible to estimate the additions and deletions necessary to go from an ownership to use basis. Rental receipts and payments should be put on an "annual rate" basis.

#### *Capacity, capacity utilization, and other supplemental measures*

Measures of capacity and its utilization would significantly increase the usefulness of wealth estimates. Wealth measures would also facilitate the construction of certain capacity indexes. The working group wishes to encourage the continuation of work currently underway to improve capacity measures. Hopefully, the state of knowledge in this area will be such that by the time wealth estimates appear—around 1970—capacity measures will be available which can be used in conjunction with them, thus adding to their usefulness.

Currently available physical measures of assets should be used to the greatest extent possible to augment wealth estimates. These data are useful in market analyses and emergency planning.

#### SUMMARY OF FEASIBILITY TESTS AND PILOT STUDIES

The foregoing recommendations have called for feasibility tests and pilot studies. The feasibility test most critical to wealth estimates, as conceived in this report, is that to determine the asset-type detail which can be obtained. The guidelines for asset-type detail have been presented above. What remains is to determine the degree to which the desired detail can be obtained from the records of manufacturing firms.

Coordinate with the need for this feasibility test is the need for a pilot study on the economic lives of various types of reproducible fixed assets. While this study is of the highest priority, it may be necessary, because of the depth in which such a study should be made, to use existing information, such as that obtained in the IRS "Life of Depreciable Assets" study, in the interim.

A feasibility study has also been recommended to determine what information on gross book value data by age is available. In addition, pilot studies are necessary, to establish age class intervals, since the collection of gross book value by year, except for the most recent years, is probably quite impractical.

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APPENDIX II: PART J

REPORT OF THE WORKING GROUP ON FINANCE,  
INSURANCE, AND REAL ESTATE WEALTH

Prepared by DAVID J. HYAMS

MEMBERSHIP OF THE WORKING GROUP ON WEALTH IN FINANCE,  
INSURANCE, AND REAL ESTATE

Robert C. Colwell, Director of Program Division, Federal Housing Administration.

Gerald M. Conkling, Division of Bank Operations, Federal Reserve System.

Robert M. Fisher, Division of Research and Statistics, Federal Reserve System.

David J. Hyams (secretary), Wealth Inventory Planning Study, The George Washington University.

Saul B. Klamman, National Association of Mutual Savings Banks.

James J. O'Leary, Life Insurance Association of America.

Dave Lowery, Office of the Administrator, Housing and Home Finance Agency.

Catherine Martini, National Association of Real Estate Boards.

David Scribner, David Scribner & Associates, Inc.

Allan F. Thornton, Research and Statistics Division, Federal Housing Administration.

Robert Wilson, Statistics Division, Internal Revenue Service.

Louis Winnick, The Ford Foundation.

## PREFACE

The Working Group on Finance, Insurance, and Real Estate Wealth held two meetings to discuss the topics covered in this report. The writer of this report, who served as group secretary, wants to thank members for their participation and to acknowledge their very large contribution to the report.

However, the wording of the report is the responsibility of the secretary. While he has attempted to reflect the consensus of the group, no member should be held responsible for all the views expressed.

DAVID J. HYAMS.



# FINANCE, INSURANCE, AND REAL ESTATE

## I. PURPOSE AND SCOPE OF REPORT

This report examines major sources of information relevant to the making of wealth estimates for the sector. The kinds of data needed for wealth estimates are discussed, and recommendations are made about the collection of basic data and the presentation of final estimates.

The scope of this report is limited formally to the finance, insurance, and real estate (FIRE) industries described in the "Standard Industrial Classification Manual"; i.e., all those in Division G. Real estate, of course, is the most important class of tangible asset owned by business units within the FIRE sector, and the interests of the working group center on this class of asset. Since real estate also is an important asset in other economic sectors, certain recommendations are applicable to real estate, whether owned by this or another sector of the economy.

Estimates by Raymond W. Goldsmith indicate that over two-thirds of the Nation's tangible wealth consists of land and structures. Provision of benchmark value data in the detail herein recommended will serve in the analysis of a variety of economic problems, which are described in chapter 2 of the staff report and will not be repeated here.

Availability of supplementary physical measures would enhance the usefulness of the value data, particularly if the physical measures are cross classified by type of economic activity. For example, a major data gap would be closed if measures of land area could be related to site activity. The eventual availability of time series relating these variables would help in filling out the structure of urban land development theory.

## II. REVIEW OF EXISTING DATA

At the beginning of the current decade, the FIRE sector owned tangible assets with a gross book value of over \$120 billion. This estimate, based largely on Internal Revenue Service data, can be broken down into three major components. About \$10 billion belong to the financial industries (banking, insurance, etc.). Somewhat more than \$40 billion represent the tangible assets of business units which filed corporation, partnership, and sole proprietorship returns and were classified within the real estate industries. The remaining \$70 billion represent the income properties of individuals claiming depreciation on rental property as an expense on their IRS form 1040's.<sup>1</sup>

<sup>1</sup>The estimate of \$70 billion is equal to the depreciation expense claimed by individuals in connection with rental properties times the ratio of the cost of related assets reported by partnerships to the depreciation claimed by partnerships classified in real estate.

## IRS DATA

The Internal Revenue Service currently is the only source of data on the bulk of the assets of the FIRE sector. Alternative collection vehicles do exist for data about the tangibles owned by credit institutions subject to Federal supervision and the tangibles owned by insurance companies. IRS data on the FIRE industries are generated from the returns filed by corporations, partnerships, and individuals reporting rental or sole proprietorship income. Balance sheets are received from corporations and, based on the experience of a recent year, about 45 percent of the partnerships. (These partnerships account for 70 percent of the receipts.) The balance sheet completed by corporations and partnerships spreads beginning and end of year tangible asset balances among the following asset classes: buildings and other fixed depreciable assets, depletable assets, and land. Depreciable assets are shown both gross and net of accumulated amortization and depreciation.

Depreciation charged against current income, whether that of a corporation, partnership, sole proprietorship, or an individual with rental property, is supported by a schedule which calls for one of two sets of supporting data. Taxpayers who have not adopted the new depreciation guidelines (Revenue Procedure 62-21) show the following items of information :

- Description of property.
- Date acquired.
- Cost or other basis.
- Depreciation allowed in prior years.
- Method of computing depreciation.
- Rate (percent) or life.
- Depreciation for this year.

Taxpayers who choose to follow the new procedure provide these items of information :

- Group or guideline class.
- Cost or other basis at beginning of year.
- Asset additions in year.
- Asset retirements in year.
- Depreciation allowed in prior years.
- Method of computing depreciation.
- Class life.
- Depreciation for this year.

The cost or other basis of fully depreciated assets still in use is a newly required item of information. The total shown is not distributed by asset type.

The IRS tax forms also call for data on rentals. Corporations and partnerships report gross rents received and paid as separate items. Partnerships report rents received on a supplementary schedule in which each rental property is identified. Sole proprietorship schedules attached to individual income tax returns shows gross rentals paid but not those received. Those received may be found grouped with other proprietorship income, or they may be reported in the rental schedule of form 1040. This schedule also is used by individuals to detail their rental incomes.

In addition to the data they report to the IRS, the business units considered below file annual or more frequent reports with certain Federal and State supervisory agencies. Consideration should be given to the use of the statistical programs of these agencies as vehicles for the collection of needed additional data in the benchmark year.

#### BANKING

The great bulk of the tangible assets of this industrial group is owned by business units which report to one of the three Federal agencies which supervise banking. Nonreporting institutions which are a part of the industrial group as defined in the "Standard Industrial Classification Manual" include some State-chartered banks and certain units performing bank-related functions, e.g., clearinghouses, check-cashing agencies, etc.

Federally regulated banks file a call report four times each year. Additional information is collected during annual bank examinations. Identical condition reports are used by the Federal Reserve System for State member banks, and by the Federal Deposit Insurance Corporation for insured nonmember banks, and at most call dates by the Comptroller of the Currency for national banks. Tangible assets are thrown into the following accounts: Bank premises owned; furniture and fixtures; real estate owned other than bank premises. Balances shown are book values rather than historical costs. Book values may not be related at all closely to market values.

The bank examination reports provide some additional data on bank tangibles. The examination forms differ among the supervisory agencies. The form used by Federal Reserve examiners spreads the book value of premises among land, buildings, and leasehold improvements. An estimated or appraised value is placed on each of these categories and on furniture and fixtures. Other real estate holdings are itemized, including cost of acquisition, book value, and estimated or appraised value. The national bank examination form used by the Comptroller of the Currency provides an estimated market value for real estate other than bank premises. Land costs in connection with present or future bank premises are shown. The FDIC form provides an assessed value for bank premises.

In order to estimate the reproduction cost of tangible assets in banking, historical costs (in addition to book values) by year or period of acquisition will have to be reported. Also required and not currently reported are total rental payments and receipts, by major asset type.

#### CREDIT AGENCIES OTHER THAN BANKS

Three data sources at the Federal level exist for the major part of this industrial group. Savings and loan associations accounting for more than 95 percent of that industry's assets report data to the Federal Home Loan Bank Board. The great bulk of the institutions extending agricultural credit file reports with the Farm Credit Administration. About half of the credit unions are federally chartered and report to the Bureau of Federal Credit Unions (HEW). In addition to reports from federally chartered organizations, the Bu-

reau receives summaries from the States of major items on the reports filed by State-chartered credit unions.

The annual report filed by members of the Federal Home Loan Bank System treats tangible assets in the following accounts:

Real estate owned.

Office building.

Less allowance for depreciation.

Furniture, fixtures, and equipment.

Less allowance for depreciation.

Real estate owned is valued conservatively and may reflect a write-down of acquisition cost.

Rental receipts are thrown into "Gross income from operation of real estate owned" or "Gross income from office building." Rental payments for office space are grouped with utility expenses. Rentals for the use of property other than office space may be grouped with other classes of operating expenses.

The Farm Credit Administration receives periodic reports from the agricultural credit institutions which it supervises. These include Federal land banks, Federal intermediate credit banks, and banks for cooperatives. The FCA also receives the reports filed with the intermediate credit banks by production credit associations as well as the reports filed with the land bank associations. The periodic reports of these various institutions are similar in their treatment of tangible assets. The value of banking premises is separated from the value of other owned (defaulted) real estate. Furniture, fixtures, and equipment are grouped into a single account. A separate account exists for automobiles in balance sheets filed by most types of agricultural credit organizations. Both gross and net balances are shown for premises and furniture. Net figures may reflect unrealistically high depreciation rates. Other real estate usually is carried at acquisition cost.

Gross receipts from the rental of bank buildings are not shown. Expenses associated with the lease of bank space are grouped with payments for utilities. Similarly, rental payments for other types of assets are grouped with other categories of expense.

The balance sheet filed by federally chartered credit unions shows premises separately. Other tangible assets are grouped with miscellaneous financial claims.

Rental payments are included with other expenses of building operation. Rental expenses associated with other types of assets are merged with other kinds of expenses.

#### SECURITY AND COMMODITY BROKERS AND EXCHANGES

Brokers and dealers regulated by the Securities and Exchange Commission are required to answer an annual questionnaire. Security exchanges are required to file an annual balance sheet with SEC. Tangible asset accounts are not standardized.

The Commodity Exchange Authority (USDA) receives annual balance sheets from brokers dealing in regulated (agricultural) commodities. A standard report form is not prescribed. Commodity exchanges are not required to file an annual statement.

The SEC and CEA could collect data in the benchmark year by providing brokers with a special schedule on tangible assets and rental receipts and payments.

#### INSURANCE CARRIERS

Practically all business units falling within the scope of the insurance industries defined in the SIC are regulated by State commissions. Each commission requires the filing of an annual financial report by each carrier operating within its jurisdiction. The report forms used by the States have been standardized through the efforts of the National Association of Insurance Commissioners (NAIC).

Within any one State, four different annual statement forms exist, each corresponding to one of the following classes of carriers: life, accident, and health; fire and casualty; title insurance; and fraternal orders.

In connection with the assembly of data from these reports, most insurance carriers are required to file a copy of the NAIC report along with their Federal income tax returns. Stock casualty, benevolent life, and certain mutual companies, including those that are tax exempt, may but are not required to file a copy of the NAIC statement with their tax return. Some 1,500 life insurance companies belonging to the Institute of Life Insurance (New York, N.Y.) file a copy of the annual statement with that organization. The companies hold more than 95 percent of the assets of the life insurance industries. We note that summary data from these reports currently are being made available to the Office of Business Economics. The annual statement filed by life, accident, and health carriers is similar in structure to the statements filed by other carriers, although details do vary.<sup>2</sup> The book value (after depreciation) of admitted and non-admitted tangible assets are recorded in exhibit 13 of the report. Separate totals are shown for these standard categories of property:

##### Real estate:

Properties occupied by the company.

Properties acquired in satisfaction of debt.

Investment real estate.

##### Other assets:

Furniture.

Other types of property (investment and otherwise) are thrown into categories chosen by the reporting carrier. Historical costs rather than book values should be the basic data for wealth estimates.

Real property is the only category for which supporting detail is available. Schedule A of the report provides the following selected information on real estate owned at yearend:

Location and description of property.

Date acquired.

Year of last appraisal.

Amount of encumbrances.

Cost to company.

Book value less encumbrances.

Market value less encumbrances.

<sup>2</sup> In statements filed by fire and casualty, title, and fraternal insurance carriers, statement A shows data on each piece of real estate owned whether acquired in the current or in an earlier year. On the other hand, the statements filed by fire and casualty, and title insurance carriers do not show the amount of interest deducted from recorded rental receipts.

This information is provided for each property acquired during the current reporting year; properties relating to an earlier year and valued at less than \$100,000 may be grouped.

A separate section of schedule A shows the amount of real estate owned in each State (and foreign country). Aggregate market values for each State are divided between farm and nonfarm properties. This geographical classification provides the basis for the State-by-State allocation of insurance realty. We note that estimates of market values are not arrived at uniformly by reporting companies.

Estimates of gross wealth must rest on an age distribution of original costs adjusted through the use of appropriate price indexes. The amount recorded under "Cost to company" in schedule A may reflect acquisition rather than original cost. In addition, the "Cost to company" includes a value for land as well as structure, two major asset types which should be separated.

Rental payments are recorded in exhibit 5, "General Expenses." Payments associated with insurance activities are separated from those relating to the management of investments and shown on one of several lines: Line 1 "Rent" is used for premises occupied by the company, including rent on space owned by the company. Expenses associated with tenancy also are included in the balance for this line. Line 5.6 shows amount paid for the rental of office machines. Line 9.1 "Real estate expenses" includes some rents associated with this investment operation.

The allocation of wealth from sector of ownership to sector of use requires that all rental payments be shown separately and associated with particular asset types.

Aggregate real estate income is shown in exhibit 3. Rental income includes rent for the company's occupancy of its own buildings. Schedule A, discussed above, relates rental income to particular properties or groupings of real property. Rental data exclude interest payments on encumbrances, although the annual statements of some classes of insurance carriers footnote interest payments on encumbrances. It is necessary to know gross rental receipts since allocation of real estate to other economic sectors is based on reported rental receipts and payments.

#### LESSORS OF RAILROAD PROPERTIES

Lessors of railroad properties are required to file annual reports with the Interstate Commerce Commission. The report form (E) used by lessors is an abridged version of that used by large line-haul and switching roads. The form used by the latter roads is reviewed in the "Report of the Working Group on Transportation." For a discussion of the contents of that report, see appendix II, part L.

### III. DATA REQUIRED FOR WEALTH ESTIMATES

#### BASIC DATA

It is desirable that estimates of tangible wealth be made available in these three planes of detail: industrial, geographic, and type of asset (see ch. IV for specific recommendations). The first part of the present chapter discusses required basic data and their relation to currently

available data. The latter part of the chapter considers the valuation of real estate.

The raw data for wealth estimates are the gross (undepreciated) values from the books of account (actual or constructed) of economic units within the FIRE industries. These data can be gathered by global enumeration and by sampling. The relative extent to which the two collection techniques are employed depends on the degree of detail at which wealth estimates are to be published.

Book values must be collected in a detail sufficient to make wealth estimates by asset type within geographic area within industry. For example, data from a multiactivity company must be spread among the several industries to which the company belongs. The tangible assets of economic units operating at several locations must be related to specific geographic areas. Finally, since the number and contents of company accounts vary, some restatement of the book values will be necessary. This may involve nothing more than aggregating or spreading existing accounts. On the other hand, it may be necessary for some reporting units to recast balances in a number of existing accounts.

Existing data collection vehicles generally fall short of providing the information needed for wealth estimates. The IRS tax reporting system represents the only vehicle currently covering all segments of the FIRE sector. Of the economic units filing returns, corporations and, to a lesser extent, partnerships, file balance sheets. Sole proprietors and individuals with rental properties do not provide data on nondepreciable assets.

With reference to depreciables, each of the four classes of taxpayers is expected to complete a detailed schedule supporting his claimed depreciation.<sup>1</sup> Experience shows there is wide variation in the way in which taxpayers complete the schedule. Thus, it was expected that the IRS "Life of Depreciable Assets Study," which developed information on the ages of various classes of depreciable assets, would be based exclusively on depreciation schedule data. However, data reported in the schedule proved inadequate. In a substantial number of cases, it became necessary to contact the taxpayer for additional data. The experience suggests that it may be preferable to collect needed information directly from the respondents rather than through their tax returns. Aside from the problem of getting adequate and consistent detail in terms of asset type, the tax form represents the report of a company which may engage in more than one SIC industrial activity in more than one geographic area. Of course, the schedule supporting claimed depreciation does not request information on these two variables.

It is too early to know whether there will be an improvement in the quality of reported data in the returns of firms adopting the new depreciation guidelines.

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<sup>1</sup> Assets for which no depreciation is claimed, i.e., those that are fully depreciated, and which are still in use are grouped and their total cost is reported.

## THE VALUATION OF REAL ESTATE

Wealth statements contain two measures of reproducible assets. The first is a gross value and is equal to the cost of reproducing given assets at price levels obtaining in a particular year. The second measure of wealth is the market value of given assets at a particular time. When market values are not available, attempts to approximate them often are made by adjusting gross values for the depreciation that has occurred since the assets were new. This technique is less than ideal since at any point in time the market may place different values on similar buildings on similar sites. This results from variations in the rates of occupancy and other factors affecting income.

Some of the problems associated with making estimates of the gross and market values of buildings are discussed in the following paragraphs. Gross values are obtained by adjusting "aged" book costs with price indexes appropriate to the asset type being revalued. Two problems can be pointed out in connection with these book costs.

First, since wealth estimates of the various economic sectors will include separate values for land and structure, the cost of the latter must be separated from the total original cost. Many economic units maintain this separation since they are entitled to charge depreciation against income for tax purposes, e.g., most members of the FIRE sector. However, other economic units either file no tax returns, as in the case of governmental entities, or have no reason to separate the two assets, e.g., households.

Even when cost data are available, they doubtlessly refer to acquisition rather than original costs when the current owner is not the original owner. This creates a major valuation problem when dealing with assets having long lives and which have had several owners. The problem of obtaining original costs also arises in connection with additions and alterations to structures. Determining what alterations have taken place (even assuming one owner) and the associated costs is troublesome where the structure is old and property records are poor.

Price indexes used in revaluation should reflect changes in input prices, efficiencies in production techniques, and regional differences in both prices and techniques. Traditional construction indexes do not allow for improvements in construction techniques.

Unless the structure is new the estimation of a separate market value for land and another for structures raises both conceptual and practical problems. If the structure is new, its market value is assumed to be equal to the cost of construction, although, as mentioned above, prospective occupancy rates can create a spread between cost and market. The problems arise in developing a basis for depreciating a less-than-new structure since that is what is done, in effect, when market price is decomposed into values for land and structure. The lifespan of structures often is associated less with physical wear than with changes in the demand for the site land. The conventional linear curve based on life experience does not reflect the erosion of value due to wear. Recourse to market data is necessary to develop curves reflecting the changes in value due to age. Market depreciation studies require the collection of the market prices of properties (sites and buildings) similar in all respects (including occupancy) but the age



of the structure. The resulting array of values provides the basis for market depreciation rates. As a practical matter, of course, assembly of such data is difficult.

The need for market depreciation data exists whether wealth in buildings is approached by applying ratios to collected estimates of real estate values or by adjusting estimates of reproduction cost to account for physical wear. Ratios of land to total real estate values can be obtained from assessment data in many jurisdictions, although their accuracy in reflecting true market values of land and buildings is open to question.

#### IV. RECOMMENDATIONS

1. Wealth should be valued on two alternative bases. The first corresponds to gross reproduction cost; the second, to market value. Wealth estimates should be distributed by asset type, i.e., land, buildings, equipment, materials and supplies, and inventory. Land and buildings whether or not owned within the FIRE industries, should be associated with major site uses, i.e., residences, retail stores, multi-use offices, manufacturing activities, etc.

2. The major goal of a wealth inventory is the generation of value estimates. However, there is a need for better data describing the physical characteristics of real estate whether or not owned within the FIRE industries. To the extent practicable, we recommend the simultaneous collection of both categories of data. We call attention to the need for the following measures of the characteristics of buildings: type of structure; number of floors; whether or not equipped with elevator; whether or not air conditioned. Collection of data showing the space (square feet within structures and land areas) dedicated to various economic activities would fill a major data gap. The activity classification chosen should be consistent with whatever uniform land-use coding system emerges from the current efforts of the Housing and Home Finance Agency and others.

3. In collecting raw data for value estimates and information on physical characteristics, maximum use should be made of current Federal reporting vehicles. In the benchmark year, reports should be expanded to collect required data. Agencies currently collecting data include those supervising banks, savings and loan associations, and farm credit institutions; also those supervising Federal credit unions, security and commodity brokers. The fact that most insurance carriers file copies of the annual NAIC statement along with their Federal tax returns provides a central source of data from these statements.

The contribution that IRS can make in providing data for wealth estimates needs early and thorough study. It is a fact that IRS has the only statistical reporting system covering the bulk of the tangible assets in the FIRE sector, i.e., the more than \$40 billion owned by business units other than financial intermediaries and individuals with rental property. However, IRS experience with the "Life of Depreciable Assets Study" shows that tax returns (at least, those filed by corporations) fall short of providing all needed data. It is doubtful whether that tax-collecting agency would be willing directly to sample taxpayers for additional data unless the needs of the wealth estimator and tax collector coincide. There are some grounds for expecting such a coincidence, given their mutual interest in the lives of depreciables.

Where tax returns are inadequate and recourse to the taxpayer by IRS is not possible, then a new Census Bureau program represents an alternative vehicle for collecting benchmark data from corporations, partnerships, and sole proprietorships in the FIRE industries. In the case of individuals with rental properties, it may be more efficient to collect required data as part of the enumeration of household wealth, even though these rental properties are not classified as household wealth.

4. The usefulness of data on real estate is increased with the degree of geographic detail since markets for building space are essentially local and nonmovable. The provision of data at the county level is a desirable longrun goal, since counties are the building blocks of standard metropolitan statistical areas. Counties, unlike SMSA's, are remarkably invariant to change.

5. Data on the tangible assets of business units within the FIRE division should be presented in some industrial detail. Each two-digit industry should be distinguished. Finer detail should be shown within certain of the two-digit industries. These are indicated below by appropriate indentation.

Banking (60)

    Mutual savings banks (603)

Credit agencies other than banks (61)

    Savings and loan associations (612)

    Bond and mortgage companies (6152)

Security and commodity brokers, dealers, exchanges, and services (62)

Insurance carriers (63)

    Life insurance (631)

Insurance agents, brokers, and service (64)

Real estate (65)

    Operators of nonresidential buildings (6512)

    Operators of apartment buildings and of dwellings other than apartment buildings (6513-14)

    Lessors of agricultural, forest, mining, oil, and public utility properties (6515-16, 6518)

    Lessors of railroad property (6517)

    Lessors of real property, n.e.c. (6519)

    Agents, brokers, and managers (6531)

    Title abstract companies (6541)

    Subdividers and developers (6551)

    Operative builders (6561)

Combinations of real estate, insurance, loans, law offices (66)

Holding and other investment companies (67)

    Real estate investment trusts

Our recommendations respecting industrial detail are consistent with the SIC with one exception. We suggest that data on real estate investment trusts be shown separately. These trusts do not now correspond to any SIC industry.

While it is necessary that the industrial divisions selected for the presentation of financial data (which is the responsibility of another working group) will differ in detail from the industries used for tangible assets, both should be capable of collapse into identical groupings at the two-digit level.

6. Estimates of wealth used by industry (as companions to estimates of wealth owned) require the collection of additional data from business units within the FIRE industries. Lessors will have to report the value of leased properties by major asset type (single-family residence, multifamily residential building, office building, etc.) and associated rental receipts. Lessees of property will report rental payments by major asset type. With these data, it will be possible to allocate wealth from industry of ownership to industry of use.

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APPENDIX II: PART K  
REPORT OF THE WORKING GROUP ON TRADE  
WEALTH

Prepared by STANLEY C. HOLLANDER

#### MEMBERSHIP OF THE TRADE WORKING GROUP

Theodore N. Beckman, College of Commerce and Administration,  
Ohio State University.

Orin E. Burley, Wharton School of Finance and Commerce, Univer-  
sity of Pennsylvania.

Alfred Eisenpreis, Allied Stores.

Murray F. Foss, Office of Business Economics, Department of Com-  
merce.

Ole Johnson, College of Business Administration, American Uni-  
versity.

Harvey Kailin, Business Division, Bureau of Census.

Stanley C. Hollander (secretary), Michigan State University.

Harold C. Passner, Eastman Kodak Co.

Robert Schiedel, Business Division, Bureau of the Census.

Myron S. Silbert, Federated Department Stores.

## PREFACE

The Working Group on Wealth in Trade met twice, on October 4 and November 15, 1963. At both meetings the group considered concepts of wealth with particular reference to wealth in trade, examined the uses of wealth data in the wholesale and retail trades, and, in some detail, discussed the problems of collecting, assembling, and presenting such data. At its second meeting the group also reviewed a memorandum outlining currently available relevant statistical series. Following the second meeting a draft report was circulated to all members for comments, recommendations, and criticisms. However, the final wording of the report is the responsibility of the secretary. While he has attempted to reflect the concensus of the group, no member should be held responsible for all the views expressed. Individual members have been free to write supplementary statements presenting their own views if they so desire.

A number of persons in addition to members of the group, including David J. Hyams and John W. Kendrick, attended meetings of the group and made helpful suggestions.

STANLEY C. HOLLANDER.

## TRADE

### I. USES OF WEALTH IN TRADE DATA

Statements as to the general usefulness and limitations of a wealth inventory as part of overall national aggregative statistics, as for example, in macroeconomic forecasting, appear in the staff report. Duplication of such statements here seems redundant, and the discussion at this point will be limited to the trade-related utility of wealth data.

However, the group does want to point out that many of the most significant benefits to trade from a wealth inventory will arise out of the accumulation of information about wealth in nontrade sectors. Consumer wealth information should be particularly useful in indicating market conditions and hence in directing trade activity toward its most useful applications. The wholesale trades will benefit from pictures of industrial, consumer, and retail trade investment. Similarly trade wealth data should be quite useful to manufacturers and to other suppliers for the analysis of distributive channels. City planners, urban geographers, real estate developers, lending institutions, and others with either theoretical or operating interests in the location and size of distributive institutions will gain from the trade wealth inventory.

Nevertheless, the trade wealth inventory will have many applications within the fields of wholesale and retail distribution themselves. It will further several major lines of theoretical investigation. One of these is in the promising area of comparative marketing studies, where an attempt is being made to examine the variations in marketing practices and institutions that are associated with environmental differences. Although this approach is not new, it has received increasing impetus in recent years from the growing outreach of trade and from recent worldwide improvements in national economic statistics. Perhaps the outstanding work in this field is Margaret Hall, John Knapp, and Clement Winsten's study of the relationships between population, income, and urbanization on one hand, and the number, size, variety, and employee sales performance of British, Canadian, and United States retailers on the other hand.<sup>1</sup> This study is particularly significant because of its detailed exploration of intranational, as well as international, variations. Although most other recent studies in this field have painted with broader strokes, detailed work undoubtedly will follow as the data become available. Information on the nature and distribution of trade assets, as well as of trade population and sales, would greatly facilitate such analysis.

A second major line of investigation is in the field of retail and wholesale productivity. The desirability of being able to measure the

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<sup>1</sup> "Distribution in Great Britain and North America," New York: Oxford University Press, 1962.

relationships between inputs and outputs in various branches and sectors of the distributive trades is obvious. However, for lack of a better unit, most studies in this field have been forced to use such measures as sales per employee or, at best, value added per employee, as if labor were the only input factor. Figures on a per employee basis, always unsatisfactory, will become even less useful if the current apparent trend toward increased use of capital in trade continues. Increased use of automation and of self-service should reduce the meaningfulness and usefulness of employee-based data. A wealth inventory would help furnish a better basis for measurement of productivity in the trade sector by providing information on the capital inputs in that sector.

A valuable byproduct of productivity studies will be identification of promising areas for research and experimentation in marketing. The ratio of rented plant and facilities to owned plant and facilities seems to be higher in the distributive trades than in many other economic sectors. Recent marketing analyses in the Department of Agriculture suggest, as one might expect, that productivity comparisons based solely upon total capital used will differ markedly from comparisons based solely upon capital owned. The group recommends that use, as well as ownership, figures be reported in the inventory.

Many observers believe that the nature of wholesale and retail trade is changing at the present time, and that automation and self-service techniques are gradually increasing the capital intensiveness of those trades. These beliefs, however, are very largely only impressions. A wealth inventory would provide a valuable benchmark for the measurement of future change.

As indicated below, many governmental and private statistical series are now prepared for interfirm comparisons in the distributive trades. Although these series are mainly concerned with operating and income statistics, an asset inventory would provide a firm statistical anchor for many of these reports. If it should prove possible to make any detailed supplementary analyses of the inventory data, e.g., distributions of assets of particular trades by asset size or distribution of income/asset ratios, new insights might be obtained into the relative heterogeneity or homogeneity of individual trades. These insights, in turn, probably would be very useful for, among other things, testing and defining the proper applicability of many current series.

The wealth inventory can be useful to management in indicating conditions of balance or imbalance between the market for, and the supply of retail and wholesale facilities. To some extent this application requires geographic breakdowns, such as are discussed below in the recommendations.

The inventory should provide useful guidelines or indicators of average investment per establishment in the various distributive trades. Such information will be helpful to entrepreneurs, bankers, suppliers, and others involved in trade investment decisions. Many consumer goods wholesalers, in particular, assume guidance responsibilities toward their retail outlets, and would be aided by this type of information.



Other uses of the data undoubtedly will suggest themselves over time. However, we should at least note in passing that the wealth inventory would help in pointing up the often overlooked major national investment in distribution.

## II. CURRENTLY AVAILABLE DATA

In addition to the reports described below, a considerable number of statistical series are prepared on behalf of individual trades by various trade associations, university research bureaus, and other organizations. These series are extremely valuable in the context of their own objectives, and in some cases will be quite useful for rough checks on wealth inventory results.

But, in general, these nongovernmental series have not been designed to serve as a base for a wealth inventory. They mainly relate to the operating statement, rather than to the balance sheet. (Some do obtain inventory turnover rates, and may or may not have dollar inventory figures. Also some series do obtain sales/total asset ratios. However, the emphasis in these series is usually on operating and income statistics.) The data are drawn, as a general rule, from voluntary, non-random samples, and hence are not subject to estimation of sampling error. Considerable variation exists in the degree of rigor and control exercised in the reporting and analysis of the data: most of the series provide inadequate detail on asset structure; geographic asset data are rare; many of the series are prepared on a firm-by-firm basis; and the kind-of-business classifications in at least some cases depart from SIC categories. Moreover, regardless of the statistical merits of each individual series, it must be remembered that the collecting agencies have worked individually, and have not designed their reports to be additive.

Therefore the group finds itself close to the view expressed in 1949 by the International Chamber of Commerce's International Committee on Distribution Statistics:

The International Committee on Distribution Statistics, in devoting its attention primarily to the problems of distribution censuses, has not overlooked the great importance of developing other sources of statistical data useful for studying distribution problems. It recognizes that important contributions can be made by the work of trade associations, individual firms, and research agencies in compiling statistical data, particularly by the use of sampling techniques. The International Committee on Distribution Statistics considers, however, that reliable census data are the foundation of statistical research into the problems of distribution, and the experience of countries where distribution censuses are well developed seems to confirm this. (Distribution Censuses: An International Study, pp. 5-6)

The major sources of wealth data for retail and wholesale trade at the present time are:

### A. INVENTORY DATA

#### 1. Retail inventories

(a) The Bureau of the Census Annual Retail Trade Report shows cost value of yearend inventories, and computes sales-inventory ratios for retail trade. A breakdown by kind-of-business provides totals for each two-digit major group, for some three-digit groups, and for some four-digit industries. In a few cases, even finer classifications are shown. Thus industry 5511 "Passenger car dealers" is subdivided be-

tween franchised and unfranchised dealers. Inventories are valued at cost, using the respondents' own valuations.

Data are obtained from a probability sample that contains approximately 125,000 to 135,000 establishments. Total coverage is obtained of group II firms, i.e., those operating 11 or more stores. The remainder of the sample consists of stores located within 233 census sample areas. All "large" stores within the sample areas are polled, the definition of large varying with kind of business and area: all "special" or intermediate sized stores within specific geographic subsamples of the sample areas, and rotating panels of all remaining stores with the same subsamples complete the sample. The group II (large, multiunit) organizations report on a firm-by-firm basis. However the general practice among these organizations is to develop at least yearend establishment dollar inventory figures for internal control and for tax purposes. Probably, most of these organizations also develop interim or perpetual dollar inventory figures on an establishment basis. For many or most of the remaining stores (i.e., the group I organizations) the establishment and the firm are identical.

(b) A monthly retail inventory series, based on reports drawn from the same sample, is published by the Office of Business Economics. While the fixed portions of the annual and monthly report samples are the same, the yearend report embraces data from more of the rotating segment stores than are used in any one monthly report. The annual data are also superior in that many of the respondents, particularly the smaller stores, are able to provide more precise figures at the yearend. In fact a fair number of firms within the sample do not maintain inventory records that show month-end figures. Some of these firms estimate their monthly inventories, using methods that vary considerably in accuracy. Others simply do not report monthly figures; and as a result, the monthly reporting is less complete than the annual series.

(c) Censuses of business. All multiunit firms with 250 or more employees (approximately 6,500 firms) are being asked to complete 1963 Business Census form NC-K1, which requests year opening and ending inventory figures at cost. Some 600 single unit *non*manufacturing firms may be asked to complete a similar form, NC-K1-S, which is currently under consideration. The two forms, if both are used, would provide data for approximately 1,200 retail firms.

(d) The Federal Reserve Board has published an annual and a monthly index of department store inventories, valued at retail selling prices. Data were furnished by a voluntary sample, consisting (January 1962) of some 1,539 stores estimated to hold about 73 percent of all department store inventories. The sample included independent department stores, and sectional, regional, and national department store chains. In recent years there has been considerable controversy as to whether the FRB sample was sufficiently representative of total general merchandise business, or whether some more comprehensive unit of analysis would be more meaningful. Sampling error could not be estimated for the FRB figures. The FRB has recently discontinued this series, and the Bureau of the Census will now provide all of the official monthly inventory estimates.

(e) Internal Revenue Service. The IRS series "Corporation Income Tax Returns" (D.I.a.) includes inventory figures for retail corpora-

tions, collected on a firm-by-firm basis. Data for integrated firms are not broken down by segments. The IRS series "U.S. Business Tax Returns: Sole Proprietorships, Partnerships and Corporation" includes inventory figures for retail trade firms, divided into the three legal-form-of-organization categories, and into detailed kind-of-business classifications.

(f) Harvard figures. The Division of Research of the Harvard Business School collected operating statistics for several types of retailers, such as department stores, variety stores, and grocery chains annually up to and including 1962. These series are now being transferred to other institutions. The Cornell University College of Agriculture is assuming responsibility for the grocery chain series. The National Retail Merchants Association will prepare the department store and departmentized specialty store figures, subject to some revision in concepts and content. These Harvard reports have been based upon voluntary samples that have varied in size from year to year. Only operating statistics have been presented, mainly as weighted averages of ratios to sales. However, the published reports do contain average inventory turnover rate data that may possibly be useful as checks upon other data.

(g) In October of every year, Dun's Review publishes its "14 Important Ratios for Retail Trade." The figures published are entirely in ratio form, but several of the ratios report on the relationships of inventories to various balance sheet and income statement items. The data are classified on a kind of business basis, but the extent to which the classification coincides with census categories is not known.

(h) The Robert Morris Associates, a national association of bank loan offices and creditmen, issues its "Statement Studies" annually. This volume is based upon compilation of operating and balance sheet statements taken from the files of member banks and checked by members of the association. Net inventory is one of the reported figures. The 1960 studies contained consolidated figures for 4,512 retail firms divided into 36 lines of trade. Further subdivisions within each line of trade report on three or four size breakdowns, based upon asset size. The sample is not a probability sample of all retail firms, and probable error cannot be computed. No geographic breakdown is published. The data are confined to those of small- and medium-sized firms, since limits of \$10 and \$25 million (asset size) are used, depending upon the line of trade involved.

## 2. Wholesale inventories

(a) A basic series appears in the Bureau of the Census' monthly wholesale trade report. This series reports merchandise owned by merchant wholesalers at month end, valued at cost. Manufacturers' sales branches and offices, consigned merchandise, and agent middlemen are excluded. The agent middleman category includes commissionmen, brokers, manufacturers' agents, and the like who have no owned inventory when acting in conformity with their classification. Nevertheless, in actual operation, this group includes firms that hold varying amounts of consigned and owned merchandise.

The classification of firms is mainly by three-digit industries. Data are broken out for some four-digit and some even finer classifications in some commodity fields. Some regional breakdowns are published.

Data are received from a probability sample of 17,000 firms. One thousand large firms report monthly. The other 16,000 are divided into four panels, each of which reports every fourth month. Data are obtained on a firm-by-firm basis.

(b) Censuses of business. The 1963 Wholesale Census will obtain beginning and end of year inventory figures for merchant wholesalers, agents and brokers, assemblers, manufacturers' sales branches and offices, and petroleum bulk plants.

(c) IRS series "Corporation Income Tax Returns" (D.1.a.) and "U.S. Business Tax Returns: Sole Proprietorships, Partnerships, and Corporations," present wholesale inventory figures, collected on a firm-by-firm basis. The corporation series includes a separation between inventories reported on LIFO (approximately \$450 million in fiscal 1961), FIFO (approximately \$5.8 billion), and method not stated (approximately \$5.9 billion).

(d) The Robert Morris Associates' 1960 "Statement Studies" contained consolidations of statements from 4,350 wholesale trade firms divided into 44 lines of trade.

## B. BUILDINGS, EQUIPMENT, FURNITURE, AND FIXTURES

### 1. Retail

(a) The IRS corporate series (D.1.a) includes depreciable assets, both before and after the deduction of accumulated amortization and depreciation. Depletable assets (a considerably smaller figure) are also reported, both before and after the deduction of depletion reserves. Valuations and reserves are based upon the taxpayers' choice of methods. Some intangibles, such as patent rights (which would be relatively unimportant for retail trade) are included in the category of depreciable assets. The IRS has reportedly encountered considerable difficulty in developing asset and depreciation data from the distributive trades in satisfactory form for statistical purposes. The published figures do not provide any breakdown of depreciable assets by asset category.

(b) Census forms NC-K1 and, if used, NC-K1-S (1963 Census of Business, multiunit firms, and large, single-unit nonmanufacturing firms) request information on 1963 capital expenditures broken down between new structures and plant additions; new machinery and equipment; used plant, machinery, and equipment; and mineral property development. (The last category, of course, being relatively unimportant for the distributive trades.) Net value of depreciable and depletable assets is also requested.

(c) "Supermarket Merchandising," in its April issue, reports square footage of total new supermarket space and supermarket selling space added during the year preceding, based upon reports from a sample (method of selection not indicated) of about one-third of all new markets opened during the period. Discontinuances are not indicated, and consequently net change figures cannot be obtained from this report.

(d) The Harvard figures discussed above include statistics on weighted average returns per square foot. Whether absolute square footage figures could be obtained from this source is not known. In

any event, it is extremely doubtful that such figures could be projected to obtain total footage even in the covered lines of trade. The NRMA, which as noted is absorbing responsibility for the department store figures, may attempt to develop total square footage reports.

(e) Several local inventories of retail space have been prepared for various communities in the country. The nature and value of these inventories, of course, vary from case to case.

## 2. Wholesale

(a) The IRS corporate series also includes depreciable assets for wholesale trade.

(b) Similarly, the census forms NC-K1 and, if used, NC-K1-S will obtain depreciable asset data from the designated large firms in the wholesale trades.

(c) Some detailed information on spatial facilities in one or two lines of trade is collected in the petroleum bulk stations and the public warehousing reports of the census of business.

(d) The 1963 Census of Business will obtain wholesalers' square footage of storage space, classified between single- and multi-story building space.

### C. INTANGIBLE ASSETS

#### 1. Retail

(a) The monthly retail trade reports (A.1.b.) develop information on accounts receivable owned by retailers, reporting both totals and a division between charge and installment credit. These figures are republished in the annual retail trade report (A.1.a.). Some retailers include paper owned by financial subsidiaries, others do not. However, the Bureau of the Census is hopeful of resolving this problem of differences in reporting in the near future. Accounts payable assigned to banks and to other financial intermediaries are not shown.

(b) IRS corporate retail trade figures include notes and accounts receivable owned by retailers, stated both before and after reserve for bad debts. The reserve figure is somewhat overstated, however, since it includes reserves set up against real estate mortgage losses, a separate balance sheet item.

(c) The Robert Morris Associates' "Statement Studies" show accounts receivable and marketable securities owned.

#### 2. Wholesale

(a) The quinquennial census report, "Wholesale Trade: Receivables and Bad Debt Losses," shows merchant wholesalers' yearend receivables resulting from sales of merchandise and services, broken down into detailed kind-of-business and geographic classifications.

(b) The Robert Morris Associates' "Statement Studies" publish the same data for wholesale firms as for retail firms, above.

### D. TOTAL ASSETS

#### 1. Retail

(a) The major source currently available is the Internal Revenue Service series, "Statistics of Income: Corporation Income Tax Returns." This series is based upon returns from all large corporations and a stratified random sample of known probability of returns from all other income and asset size strata.

The data are collected on a firm-by-firm basis. Assets are divided into the following major categories: (1) Cash, (2) notes and accounts receivable, (3) inventories, (4) investment in Government obligations, (5) other current, (6) loans to stockholders, (7) mortgage and real estate loans, (8) other investments, (9) depreciable assets, (10) depletable assets, (11) land, (12) intangible assets, and (13) other assets. Reserves are shown against items 2, 9, 10, 12. The taxpayers' own valuation and reserve procedures are used, provided that they are in apparently acceptable form for tax purposes.

(b) Census forms NC-K1 and NC-K1-S will request total assets and changes in depreciable and depletable assets, as well as capital expenditures. All of these will be in dollar terms. As noted approximately 1,200 large retail firms will be covered by these two forms, if both are used.

(c) The Dun & Bradstreet "14 Important Ratios" include some based upon the tangible net worth of the respondents.

(d) Partnership balance sheet data are published by the IRS every second year in its "U.S. Business Tax Returns." The series is prepared from reports from about 70 percent of all U.S. partnerships.

(e) The Robert Morris Associates' studies report, in addition to the figures cited above, cash, other current assets, net fixed assets, all other assets, and total assets.

## 2. Wholesalers

In general, the sources of total asset data for wholesalers are much the same as those indicated above for retailers.

### GENERAL COMMENTS

There appear to be more complete data available for inventories than for other retail and wholesale trade assets. The greatest gaps in the existing data are:

(1) Little or no information about wealth *owned* in other sectors, but *used* in trade.

(2) Little or no information about physical asset units, except for data on wholesale square footage.

(3) Inadequate breakdowns of depreciable assets by asset type. Most series now available simply report a total depreciable asset figure.

(4) Inadequate information on an establishment basis. Even the available inventory data are, in many cases, on a firm basis.

(5) Variations and inconsistencies in valuation methods. This defect in the data probably can never be overcome completely. Nevertheless, the wealth inventory ideally should impose more order on the figures than now exists.

Various kinds-of-business classifications have been used by the reporting agencies, the differences to a large extent consisting of variations in the degree to which SIC classifications have been fanned out. Differences in classification also result from differences in the use of the firm or the establishment as a basis of classification. It would seem advisable to divide the wealth inventory data as finely as possible, so as to permit the resulting figures to be used, separately or in combination, as benchmarks for as many of the series as possible.

In view of the foregoing considerations, the group makes the following recommendations:

## III. RECOMMENDATIONS

The working group strongly endorses the proposal for a national wealth inventory as a major contribution to our knowledge and understanding of the total national economy and to our understanding of distributive trade economics in particular. The group recommends specifically:

1. That the inventory be taken on an establishment basis at least within the distributive trades, and preferably within all economic sectors where this basis is feasible and meaningful. The use of the establishment as the basic unit has several advantages. It is consistent with available census data and with continuing census practice. Thus establishment statistics seem to have maximum utility for benchmark purposes. Furthermore, in view of the extent to which firms engage in several types of business through vertical, horizontal, and conglomerate integration, the establishment appears as a more homogeneous and useful unit for kind-of-business analyses. In addition, the establishment provides a better picture of the location of economic activity.

2. That the inventory report wealth used, as well as wealth owned, by the distributive trades. The group recognizes the existence of problems and difficulties in the collection of use statistics, but it feels that such data would be most helpful. The relatively high ratio of leased to owned capital employed in retail and wholesale trade, as compared with manufacturing and some other sectors, makes use statistics particularly valuable for these trades. Land, buildings, fixtures, display equipment, vehicles, data-processing equipment, and other assets are often leased. Some very meaningful analyses may rest upon the total of these assets used in trade, rather than upon just those that trading firms happen to own. The reporting of wealth used, in addition to wealth owned, will shed additional light on the results of what will be somewhat legalistic and technical classifications in the ownership census. (Thus, for many economic and business purposes, consigned merchandise serves as part of wholesale and retail inventories, yet the ownership census will have to ascribe this merchandise to the supplying sectors.) To be consistent, the use census should assign to the employing sectors the probably relatively small amounts of merchandise that are rented out or consigned to other sectors by wholesale and retail firms.

A. Ownership and wealth data may be obtained in two ways, either by asking the trade firms to divide the assets employed into the two categories or by asking the leasing sectors to report amounts leased to trade firms. Both approaches might fit into this study. Thus reports on total square footage used by wholesalers and retailers will cover both owned and leased space, but quite probably the typical establishment will belong in one or the other category, rather than consisting of a mixture of owned and leased space. The respondents might well be asked to indicate ownership status on the return. Figures obtained in this way can be checked against estimates derived from the reports of the real estate sector. Census form NC-K1 now requests annual rental payments, divided between rent for use of buildings and structures and rent for use of machinery and equipment (including trucks). Figures derived from this report may sug-

gest some relationships that could also be used as a check on reported relationships between owned and leased property. Some exploratory studies may well be needed to determine the most practical ways of gathering use data.

3. That the inventory should be conducted very largely in dollar terms. The group examined a number of physical units that are used for measurement in various trades, including gallonage, cubic footage, seating capacity, tonnage, number of pumps, number of vending units, and shelf space. Only two units appeared to be of sufficiently general applicability and relative use of mensuration to warrant recommendation. One is number of vehicles owned and used by type. The other, which would be very helpful for managerial analyses of market cultivation and other purposes is square footage of floorspace. Wholesalers seem to be considerably interested in a division of floorspace between space in single-story and in multi-story buildings; retailers seem less interested in having this classification reported. In various trades it would appear both useful and possible to subdivide space between selling, storage, and all other uses. It appears that footage figures would be desirable for practically all of the kinds of business discussed in recommendation 8, below.

4. That as a practical matter the dollar valuation of inventories should be conducted by whatever method the respondent can supply that most closely approximates cost or market, whichever is lower, based on FIFO assumptions. A special effort should be made to obtain an indication from the respondent of the method actually used, so as to facilitate any adjustments that may appear necessary in collating the reports. Book inventories should be reduced by an appropriate estimated shrinkage figure. Many large firms use the so-called retail method, in which the current selling prices of stocks on hand are reduced through subtraction of the firm's average initial markup for the classification of goods under consideration to determine computed cost figures. The deviation of the result from that which would obtain under the more traditional method of computation appears trifling. A large share, and perhaps all, of the relatively few trading firms that make LIFO adjustments to their inventory valuations would be able to report preadjustment FIFO figures without difficulty. Further, the group urges that in the selection of an inventory date, due recognition be given to seasonal and tax date fluctuations of distributive inventories. Merchandise in transit should be assigned on the basis of ownership. Although the in transit inventory probably will be only a small portion of total inventories in this and other sectors, it will present a problem that should be handled consistently in all the sectors where it arises.

5. That the valuation of other physical assets be conducted on the basis of acquisition cost, less depreciation, adjusted for price level changes. In order to obtain relatively uniform figures, the group would prefer to have the depreciation computed by the collecting agency, using Internal Revenue Service guideline annual rates of depreciation for each category of assets. Thus it is recommended, for example, that retail counters and fixtures be depreciated on a 10-year schedule. This would mean that acquisition date information would have to be collected for all depreciable assets. Price indexes would also be needed for each major asset category, but it is believed that



reasonably satisfactory indexes can be obtained from a variety of sources.

6. That the physical assets be broken down into the following categories:

(a) Merchandise inventory, measured in dollars.

(b) Land, measured in dollars and square footage.

To the extent that it is feasible, shopping center parking spaces, service areas, and access roads and other land that is used in common should be allocated between establishments in the assets used inventory possibly on the basis of the relative floorspace of the establishments themselves.

A better way of allocating parking space and access roads would appear to be on the basis of the relative dollar sales volume of the stores in the center. The extent to which the parking space is used by the customers of any one store would seem, roughly, to be the result of the number of transactions in that store multiplied by the average time per transaction. The dollar sales volume, of course, is a function of the number of transactions and the dollar size of the average transaction. Since time and dollar size per transaction are probably roughly correlated, dollar sales volume would give an approximate indication of relative utilization of the space.

Alternatively, if real estate is valued through capitalization of rentals, the nonincome producing portions of shopping centers and other structures will automatically be allocated on the basis of relative rents. One drawback to this alternative, in the case of shopping centers, is that a number of factors, of which the desirability of space is only one, enter into the determination of the individual tenant's rental rate per square foot. The nature of shopping center leasing would thus introduce some systematic bias into capitalized rental valuations. Nevertheless, the group feels that this method probably would deliver reasonably satisfactory figures.

(c) Buildings, measured in dollars and square footage of floorspace. (See recommendation No. 3 for comments.)

(d) Motor vehicles, measured in dollars and in number of vehicles, preferably divided between automobiles, trucks, and motorcycles.

(e) All other, measured in dollars. The group recognizes the difficulties of further subdivision within the "all other" category. Nevertheless, it would urge that, to the extent possible, perhaps within selected industries, this category should be broken down to show separate dollar figures for (i) processing and workroom equipment, (ii) materials handling equipment, (iii) furniture, sales fixtures, and display equipment, (iv) tabulating, data processing, and computing machinery, and (v) other.

7. That the retail and wholesale trades be determined to include all establishments within the "5" SIC classification. Manufacturers' sales offices and branches should be included within wholesale trade. Preparation of the inventory on an establishment basis would facilitate their inclusion.

Although the group is not unanimous on this point in view of the problems of noncomparability inherent in departing from past classi-

fication practices, several members very strongly urge that chainstore warehouses, which really perform a wholesaling function, ought to be included as part of wholesale trade. If this suggestion is followed, the warehouse figures should be reported in the first wealth inventory in a manner that will permit overlapping comparisons.

8. That the kinds-of-business classifications follow the 1963 Census of Business lines using about 12 to 15 divisions within retail trade and about 15 to 20 within wholesale trade. In retail trade, the group recommends the use of the major divisions: food; eating and drinking places; general merchandise; apparel; furniture and appliance; lumber, building materials, hardware and farm equipment; automotive; all other; plus fanned out figures for department stores, gasoline stations, drugstores, and probably furniture, lumberyards, liquor, and variety stores.

In wholesale trade the following divisions seem most appropriate: motor vehicles and automotive equipment; chemicals and allied products; drugs; dry goods and apparel; groceries and related products; farm products and raw materials; electrical goods; hardware; plumbing and heating supplies; machinery, equipment and supplies; metals and minerals; petroleum; scrap and waste materials; tobacco and tobacco products; beer, wine, and alcoholic beverages; paper and paper products; furniture and home furnishings; lumber and construction materials; all other.

9. That geographic breakdowns be provided to the fullest extent possible. In both the wholesale and retail trades, for most managerial purposes, standard metropolitan area breakdowns are more meaningful than State-by-State breakdowns, and so the group recommends that SMSA classifications be used in preference to, or in addition to State ones. Nevertheless, the group also recognizes the extra costs involved in collecting and preparing geographical analyses, particularly if sample studies are used as suggested below. If a choice has to be made the group would sacrifice geographic detail for kind-of-business detail. Consideration should also be given to the merits of collecting only selected items, such as floor space, from large groups or from the total population, so as to permit geographic breakdowns or to confining the geographic breakdown to selected metropolitan areas.

10. That insofar as is consistent with the foregoing recommendations, sampling techniques be used to obtain data from the large population of small businesses in the distributive trades.

11. That breakdowns between single-unit and multiunit firms would be desirable, at least for the retail trades if the data can be obtained without too much difficulty. Probably organizations with four or more establishments should be considered multiunits although a "10 or more" cutoff would also be satisfactory. However, the classification of franchised and nonfranchised firms that is used in some enumerations of automobile dealers does not seem easily extendable to other trades.

12. That insofar as is possible, the data collected, tabulated, and preserved in a fashion that will facilitate supplementary analyses such as conceivable distributions by asset size, by ratio of owned to leased assets, and by income/asset ratio.

13. The group has not prepared recommendations on the handling of intangible assets. It does wish to note problems in treatment of assigned financial claims. It also wishes to note the importance in business and economic life of such intangibles as good will and human ability, although it recognizes the impracticality of expressing these assets in dollar terms in the national inventory.

14. That although existing sources of data should be utilized where available and satisfactory, the Bureau of the Census is the logical primary collecting agency. The Bureau's experience, talent, and public respect particularly equip it to deal with the problems and difficulties of the inventory.

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APPENDIX II: PART L

REPORT OF THE WORKING GROUP ON  
TRANSPORTATION WEALTH

Prepared by DAVID J. HYAMS

#### MEMBERSHIP OF THE WORKING GROUP ON TRANSPORTATION WEALTH

- John E. Clayton (chairman), Transportation and Facilities Research Division, A.M.S., Department of Agriculture.
- Donald E. Church, Transportation Division, Bureau of the Census.
- P. L. Conway, Jr., Finance, Accounting, Taxation and Valuation Department, Association of American Railroads.
- Warner H. Hord, Office of Carrier Accounts and Statistics, Civil Aeronautics Board (Miss Fredlyn Ramsey served as alternate to Mr. Hord).
- David J. Hyams (secretary), Wealth Inventory Planning Study, The George Washington University.
- Edward V. Kiley, Department of Research and Transportation Economics, American Trucking Associations.
- Edward Margolin, Bureau of Transport Economics and Statistics, Interstate Commerce Commission (Mr. Margolin was represented at two meetings by Mr. William Kendall).
- E. G. Plowman, Office of the Undersecretary for Transportation, Department of Commerce (Mr. Plowman was represented at one meeting by Mr. Edward Hassell).
- Alvin Shapiro, American Merchant Marine Institute (Mr. Chester Szychliński served as alternate to Mr. Shapiro).
- Frank A. Smith, Department of Research, Transportation Association of America (Mr. Smith was represented at one meeting by Mr. J. Philip Carlile).
- Ernest W. Williams, Jr., Graduate School of Business, Columbia University.

## PREFACE

This report is the product of three daylong meetings of the Working Group on Transportation. The writer of this report, the group secretary, takes this opportunity to acknowledge that fact and to thank members for their participation. Appreciation is also expressed to the following persons who attended one or more meetings and contributed to the discussions: B. H. Moore, John W. Kendrick, and Joseph R. Rose.

The final wording of the report is the responsibility of the secretary. Whereas he has attempted to reflect the consensus of the group, no member should be held responsible for all the views expressed. Individual members have been free to write supplementary statements clarifying their individual views if they so desired.

DAVID J. HYAMS.

# TRANSPORTATION

## I. WEALTH IN TRANSPORTATION

### INTRODUCTION

This report is about the measurement and classification of transport wealth, with particular emphasis on that part owned by private firms holding themselves out to perform transport services.

In the first chapter, transport wealth is defined and discussed in its several aspects. The second chapter contains the working group's recommendations for the classification of privately owned transport wealth. A large share of this is owned by business units which report to Federal agencies, usually as part of the regulatory process. It is possible to compare the data available through the typical regulatory report with the recommended data objectives and to point out general deficiencies in data availabilities. In the remaining chapters, the report moves from the generalities of chapter II through a detailed industry-by-industry review of data sources, availabilities, and gaps.

### TRANSPORTATION: FUNCTION AND INDUSTRY

Transportation can be viewed as both a function and an industry. The transport function—unlike most economic activities—is performed by all economic sectors. Transport wealth, functionally defined, includes all tangible assets that contribute immediately to the movement of persons or property between places. It includes transport vehicles, whether owned by a manufacturing company, a household, or a motor carrier. It includes such structures as airfields, oil, gas, and water pipelines, and highways and railways.

Transportation also can be viewed as an industry composed of privately owned economic units whose primary activities are related to the provision of transport and related services. The wealth of this industry is represented by the tangible assets on the books of account of the constituent business units. These assets consist not only of immediately identifiable transport-related properties like vehicles and ways but also the full range of assets which the firm has found it necessary to own in conducting its transport activity.

Measures are needed of transport wealth functionally defined and of the wealth of the transportation industries. We recommend the development of both types of measures.

### USES OF TRANSPORT WEALTH DATA

The identification of transport assets on both functional and industrial bases will serve the needs of a variety of users. The data requirements suggested in chapter 2 of the main report are met by classifying wealth on an industrial basis. This classification makes

possible the study of relationships between the transportation industries and the rest of the economy or among the transportation industries—for example, in the analysis of capital/output ratios.

Recognition of transport as a function also is useful—for example, it will result in the provision of data on the comparative investment in private and public carriage. The four-way distribution of wealth among that devoted to local and long-haul service and passenger and freight carriage that is recommended below adds further to the analytical usefulness of the data; for example, in linking transport facilities with traffic flow data.

#### GUIDELINES FOR IDENTIFYING TRANSPORT WEALTH

We discuss below the various kinds of economic units that own transport wealth—conceived both functionally and industrially.

The first group of economic units consists of firms holding themselves out as for-hire carriers. They are publicly owned like the Alaska Railroad or a municipal transit system; or, more typically, they are privately owned. They are the carriers described in the "Standard Industrial Classification Manual"—ignoring, for the present, the distinction there made between public and private ownership.

The second category of transport-wealth owners consists of the noncarriers providing the ancillary transport facilities described in the SIC—again ignoring the distinction between public and private ownership. Wealth owned by these economic units includes such facilities as Dulles Airport and the Port of New York Authority as well as their privately owned counterparts.

A third category of wealth holders includes agencies—almost always public—that own and operate public ways like the highways and improved waterway systems.

Wealth owned by each class of economic unit discussed above shares a common characteristic. It is available for public use. This is not true of the transport wealth owned by economic units engaged in private transportation as an adjunct to their primary activity. Included in this fourth category are the household automobile, the transport vehicles of governmental organizations—other than those already mentioned—and the fleets (automotive, shipping, etc.) of nontransportation business units.

The fifth and final category of transport wealth is owned by business units conventionally classified in industries other than transportation but which in a broad sense engage in transportation. These include the utility gas and water pipelines which are analogous to the pipeline transmission systems of for-hire oil pipeline companies.

Since wealth data are to be classified initially by economic sector of ownership, it is necessary to identify separately transport assets owned by economic units having a primary activity other than transportation. Distinguishing these transport assets may present some problem. Conceptually, the assets may not be clearly transport or they may be used jointly in transport and some other activity. Practically, it may not be feasible for reporting economic units to separate clearly all of their transport assets. At a minimum, vehicles (including pipelines) should be distinguished. To the extent practical, supporting structures and equipment also should be separated from other wealth. We want to



exclude from transport wealth in-plant transport assets (e.g., farm tractors, forklift trucks, conveyor belts, mine elevators), and storage facilities; also multifunction vehicles where the nontransport function is of equal or primary importance (e.g., military vehicles other than those with counterparts in the private sector, mobile homes, fire engines, dredges).

In the pages which follow, attention will be concentrated on the wealth of privately owned business units engaged in performing transportation and related services, since they are the primary assignment of the working group. However, much of the following is relevant also to the presentation of data on transport wealth owned by the public sector and by other private sectors, i.e., transport wealth functionally defined.

## II. DATA OBJECTIVES WITHIN THE TRANSPORTATION INDUSTRIES

In recommending data objectives for the transportation industries—as well as in making our earlier recommendations for the presentation of transport wealth used by economic units elsewhere classified—we have been mindful of the following. First, the availability of detail usually increases the usefulness of any data. Second, at some point the cost of collecting and preparing additional levels of detail begins to outweigh the importance of the uses to which the data will be put. Third, the statistics on the transportation industries are collectively but one of the many data blocks which together will measure the tangible wealth of the United States. We recognize the need for maintaining comparability with the general data objectives for other sectors.

In the following discussion of major data objectives, we will refer to the “typical regulatory report.” Many of the transportation industries are regulated by Federal agencies. These agencies usually require the filing of periodic reports containing asset data of interest to us. The formats of these reports are similar. Later we will identify these reports and discuss them in detail in terms of data objectives. For now, though, we want to be able to refer to a generalized regulatory report in the discussion of data objectives. Our treatment of each objective will end with recommendations for the collection of needed information not found in the typical regulatory report. This organizational technique will obviate the need for a series of repetitive comments and recommendations on the by then quite obvious data gaps observable after our detailed review of the actual reports filed by many segments of the transport industries.

We now set out our data objectives, noting the absence of data needed but not found in the typical regulatory report.

### INDUSTRY OF OWNERSHIP

The “Standard Industrial Classification Manual” recognizes 53 “minor” industries within the transportation sector. It is not desirable to present separate wealth data for each industry. Knowledge about the characteristics of the tangible assets of some industries would be of little interest because of their economic insignificance. In other instances, business units regularly engage in activities that cut across

the industrial divisions of the SIC. While these business units could be thrown into one industry or the other on the basis of their primary activity, we doubt the significance of the data as a measure of wealth for the industries.

We suggest that the 53 "minor" industries be aggregated into the 15 groups shown below. With the exception of warehousing—which we will recommend be separated from the transport industries—our groupings are consistent with the SIC. The groupings recognize the distinction between transport modes. To each grouping we have appended a summary—although not always exact—title. The four-digit minor industries composing each grouping are identified by the title and code number used in the SIC. In the interests of brevity, we have chosen not to repeat here the industry definitions found in the SIC manual.

<b>Railroad transportation :</b>	
Railroads, line haul operating.....	(4011)
Switching and terminal companies.....	(4013)
Sleeping car and other passenger car service.....	(4021)
Railway express service <sup>1</sup> .....	(4041)
<b>Local transit and highway passenger transportation :</b>	
Local and suburban transit.....	(4111)
Local passenger transportation, n.e.c.....	(4119)
Taxicabs.....	(4121)
Local passenger transportation charter service.....	(4141)
School buses.....	(4151)
Terminal and joint terminal maintenance facilities for motor vehicle passenger transportation.....	(4171)
Maintenance and service facilities for motor vehicle passenger transportation.....	(4172)
<b>Nonlocal highway passenger transportation :</b>	
Intercity buslines.....	(4131)
Intercity highway passenger transportation, n.e.c.....	(4132)
Passenger transportation charter service, except local.....	(4142)
<b>Local highway freight transportation :</b>	
Local trucking and draying, without storage.....	(4212)
Local trucking and storage, including household goods.....	(4214)
Terminal and joint terminal maintenance facilities for motor freight transportation.....	(4231)
<b>Nonlocal highway freight transportation :</b>	
Trucking, except local.....	(4213)
<b>Deep sea water transportation :</b>	
Deep sea foreign transportation.....	(4411)
Transportation to and between noncontiguous territories.....	(4421)
Coastwise transportation.....	(4422)
Intercoastal transportation.....	(4423)
<b>Nonlocal inland water transportation :</b>	
Great Lakes-St. Lawrence Seaway transportation.....	(4431)
Transportation on rivers and canals.....	(4441)
<b>Local water transportation and water transportation services :</b>	
Ferries.....	(4452)
Lighterage.....	(4453)
Towing and tugboat services.....	(4454)
Local water transportation, n.e.c.....	(4459)
Piers and docks.....	(4463)
Stevedoring.....	(4463)
Canal operation.....	(4464)
Water transportation services, n.e.c.....	(4469)
<b>Air transportation :</b>	
Air transportation, certificated carriers.....	(4511)
Air transportation, noncertificated carriers.....	(4521)

See footnote at end of table.

Air terminal facilities and services :	
Airports and flying fields.....	(4582)
Airport terminal services.....	(4583)
Pipeline transportation :	
Crude petroleum pipelines.....	(4612)
Refined petroleum pipelines.....	(4613)
Primary auxiliary services :	
Rental of railroad cars with care of lading.....	(4742)
Rental of railroad cars without care of lading.....	(4743)
Freight forwarding.....	(4712)
Arrangement of transportation.....	(4721)
Fixed facilities for handling motor vehicle transportation, n.e.c.....	(4784)
Services incidental to transportation, n.e.c.....	(4789)
Secondary auxiliary services :	
Stockyards.....	(4731)
Inspection and weighing services connected with transportation.....	(4782)
Packing and crating.....	(4783)
Public warehousing : <sup>2</sup>	
Farm product warehousing and storage.....	(4221)
Refrigerated warehousing, except food lockers.....	(4222)
Food lockers, with or without food preparation facilities.....	(4223)
Household goods warehousing and storage.....	(4224)
General warehousing and storage.....	(4225)
Special warehousing and storage, n.e.c.....	(4226)

<sup>1</sup> The only important firm in this industry is REA Express. While it is owned and controlled by a number of railroads, it operates over several transport modes. REA Express conducts substantial over-the-road motor trucking operations. It also uses air carriers in the provision of air express service. Accordingly, the industry might better be classified in SIC major group 47, "Transportation Services," than in major group 40, "Railroad Transportation."

<sup>2</sup> We recommend that data on the SIC industries included in this grouping be excluded from measures of transportation wealth. We make this recommendation because we have excluded warehousing facilities—other than the temporary in-transit storage facilities of business units within transportation—from transportation wealth functionally defined. Thus, since the storage facilities of manufacturing establishments are not transport assets, we do not want to include within the data on the transportation sector, the wealth of public warehousing firms.

The SIC, with a few exceptions, defines the primary business unit of these industries as companies. This contrasts with the establishment concept used in the manufacturing industries. In manufacturing, the primary unit is the establishment, an economic unit usually at one location and engaged in "one, or predominantly one, type of economic activity for which an industry code is applicable." Since data on assets owned by industries of establishments are usually inconsistent with data on assets owned by industries of companies, we recommend that the secondary-activity assets of transport companies be distributed on both ownership and use bases to the appropriate "other" industries. It is not necessary to collect such data at the establishment level since regulatory reporting requires a clean separation of transport and nontransport assets in the company report. However, to accommodate the analyst with interests in company data, procedures should be developed to facilitate the recombination of primary- and secondary-activity asset data into industries of companies.

In connection with the assembly of basic data, the first step in making wealth estimates by industrial group, certain generalizations can be made about regulatory reporting. The universe of business units subject to a particular chapter of Federal regulatory legislation often is not conterminous with the particular universe of business units falling within an SIC industry. This may occur because the regulated universe takes in business units belonging to more than one SIC industry—sometimes even nontransport SIC industries; or it may

occur because the regulated universe omits business units in which there is no Federal interest. When the regulated universe does not comprehend the SIC universe, we recommend the collection of required data.

## ASSET TYPE

Within each of the wealth groupings, the assets of the foregoing industrial groups should be distributed among the following asset types.

Land.

Structures:

Buildings.

Piers and docks.

Oil pipelines:

Gathering.

Trunk.

Structure below vehicle, e.g., track and road bed, landing field.

Other structures.

Transportation vehicles:

Railroad motive power.

Railroad cars.

Highway vehicles:

Trucks.

Truck-tractors.

Truck-trailers.

Buses.

Automobiles.

Vessels:

Self-propelled:

1,000 gross tons or more.

Non-self-propelled.

Airplanes:

Over 12,500 pounds gross takeoff weight.

Other vehicles, including work.

Equipment other than transport vehicles.

Materials, supplies, inventories.

These assets are used to provide freight and passenger service and in the local and nonlocal transportation of people and goods. We would like to see the wealth of each asset type distributed among the four possible use-combinations. It often will be possible to select the proper combination by reference to the asset type. For example, there usually is a sharp distinction between vehicles designed for property and passenger carriage. Most vehicles also are designed for either local or long-haul use. Where it is not immediately possible to determine use by reference to the asset type, the owner can allocate the asset among the various combinations on the basis of operating experience. For example, it is possible to divide railroad passenger cars between commuter and long-haul service on this basis. However, the inevitable conceptual problems exist in connection with the design of allocation formulas for jointly used assets, e.g., railroad way. The primary accounts of the typical regulatory report do not separate assets by use-combinations, i.e., passenger or freight service and local or nonlocal service. Some additional information undoubtedly will

have to be requested from business units in some industries to make possible this distribution.

The balance-sheet statement of the typical regulatory report distributes tangible assets among these three accounts:

Materials, supplies, inventories.

Transport properties.

Nontransport properties.

The latter two accounts are supported by schedules giving further detail. The dollar balance for transport properties is distributed among a number of primary accounts. Land is separated from the depreciable assets. Many of the primary accounts for depreciable assets are more detailed than the asset-type distribution we recommend. Some of primary accounts overlap two or more of our asset types. For example, all vehicles may be thrown into a single account; or the primary account may distinguish assets on the basis of function rather than physical type.

The schedule supporting nontransport properties identifies each property unit or operating entity not used for transportation purposes. These secondary-activity assets are to be counted with the wealth of the appropriate other industries. Since the assets of these other industries are to be classified by major type, it will be necessary for transport firms to distribute their nontransport properties accordingly.

#### LOCATION OF ASSETS

The typical regulatory report does not distribute balances in primary accounts by State of location. We recommend collection of data required to make such a distribution.

Presentation of wealth data on a State-by-State basis raises an immediate problem with respect to transport vehicles which serve across State lines and which do not regularly return to an operating base. While there are a variety of ways for making geographical allocation of these interstate vehicles, we suggest that interstate vehicles be aggregated only at the national level. The user of the data can allocate by State as he sees fit.

#### INDUSTRY OF USE

We recommend presentation of value data on the basis of industry of use, since the quantity of assets supporting a given industrial activity frequently is more relevant than the quantity of assets owned by the industry.

A statement of wealth used differs from a statement based on ownership because some assets are rented from and to other economic sectors. Adjusting the latter statement for the value of leased properties requires the collection of three items of data. Each lessee would provide a distribution of payments by type of asset rented, e.g., office space, office machinery, highway vehicles, etc. Each lessor would furnish a similar distribution of rental receipts and the book value of the respective asset classes. With these three data items from each industrial group in the economy, tangible assets could be reallocated from the owning to the using industrial group.

The income and expense statement and supporting schedules of the typical regulatory report show separately most rental payments and receipts. However, more information is required on the types of assets rented from and to others along with the respective receipts and payments.

#### VALUATION OF ASSETS<sup>1</sup>

Book values are not satisfactory measures of wealth since they incorporate prices paid for plant and equipment purchased over a span of time during which prices have changed. In order to have comparable wealth data, it is necessary to value tangible assets at the prices of a particular point in time. We recommend that wealth estimates reflect this adjustment. However, since we believe some uses would require comparing the two sets of figures, we also recommend presentation of book value data, although not at the level of detail of the adjusted values.

The adjusted data should show wealth on both gross and net (depreciated) basis. The gross value of a particular asset is its price new. Price indexes used to estimate current gross value reflect changes in factor prices and changes in the efficiency with which factors are combined. Price indexes should not reflect specification (quality) changes which have occurred between the time the model being priced was purchased and the present time and which were associated with the unit cost and corresponding price differences. (See ch. 6 of the main report.)

The depreciated or net value attached to a particular asset reflects the decline in value that has occurred because of physical wear and tear and technological and economic obsolescence. Under conditions of perfect competition (including knowledge) the depreciated value will equal market value—the present worth of a future income stream. Under less than perfectly competitive conditions, discrepancies can arise between computed depreciated values and market values. This occurs because net values mirror past depreciation experience. Past experience can be a satisfactory guide to the pattern of physical decline. It may be less than a satisfactory guide to the current rate of technological and economic (including locational) obsolescence. Not only can the rates vary with real changes in the arts or in demand, but they also may vary through the exercise of market power, or the use of regulatory authority, or, for Government facilities, from political considerations.

The discrepancy arising from a lack of correspondence between past experience and present experience can become most serious in industries with large quantities of long-lived assets. If assets are physically short lived there are more frequent opportunities to make major adjustments to technological innovation and shifts in consumer demand.

Making estimates of gross and net reproduction cost requires information on the original cost of assets by type and by year of acquisition. The typical regulatory report does not distribute book values by year of acquisition except to a limited degree. A few reports contain schedules which distribute the balance in the vehicle account by age.

<sup>1</sup> Portions of the following discussion are based on a memorandum by Prof. Ernest W. Williams. The memorandum is reproduced in annex A.

For purposes of a wealth inventory, a one-time survey is needed to provide an age distribution of book values by major classes of fixed assets. Also required are data with which to determine the appropriate depreciation rates. Price indexes also must be developed for certain asset classes in addition to those now available. The ICC has done much work in developing price indexes and depreciation rates for oil pipeline and railroad properties in consideration detail.

Of course, the age distribution of book values and the data on which depreciation rates are based must come from company books of account. We recommend a study to determine the relevant kinds of data actually available from company records. In addition, the study would consider possibilities of sampling procedures and recommend data collection techniques. The experience of the Internal Revenue Service in connection with its "Life of Depreciable Assets Study" is relevant (despite the fact this study did not develop State data).

#### PHYSICAL UNIT DETAIL

We recommend the presentation of physical-unit detail to supplement the value data. The asset types selected should be confined to those accounting for a significant portion of the industry's investment. This will require the enumeration at least of the number of vehicles by type, and miles of track and pipelines.

The usefulness of the physical data would be improved by introducing an additional level of detail showing capacity in cubic feet and pounds, by vehicle class. An age distribution of selected asset classes would add a third dimension to the physical unit data for the sector. Of course, the collection of sample data on the ages of assets within asset classes is a necessary step in estimating wealth net of depreciation. More specific recommendations for the presentation of supplementary physical detail are given in the following chapters.

#### TRANSPORT SECTOR DATA SOURCES

We now begin a review of current sources of data on each of the 53 transport industries. This review consists of seven chapters, each corresponding to one of the seven SIC major groups. Within each chapter we identify the industries falling within each major group and discuss relevant data sources, with reference to additional data requirements for wealth estimates. For most of the transportation industries, the principal data sources are the reports filed with regulatory agencies.

We believe that additional required data should be collected through existing statistical programs, since it is usually more efficient to expand a questionnaire than to inaugurate a new program. Where our industry review points up the absence of a reporting system, we will suggest various alternatives.

Throughout our data review, we assume that what is requested on a report form is in fact provided by the respondent, although some respondents either do not complete reportable items or do not complete them in a form consistent with the instructions.

Another problem arising in connection with regulatory reporting occurs because of changes in the scope of the report within a particular

transport mode. The change in scope occurs because less information is required of smaller business firms. However, some minimum amount of comparable data must be collected from all business units if they are to be represented in wealth totals and detail.

In a few instances, we have discussed particular accounts distinguished only by the insignificance of the dollar values therein recorded. However, in a survey such as this, it seemed wiser to review all accounts relevant to our objectives. Those charged with preparing wealth estimates can determine which accounts can be ignored safely.

### III. RAILROAD TRANSPORTATION

#### Group 40

Railroads, line-haul operating companies.....	(4011)
Switching and terminal companies.....	(4013)
Sleeping car and other passenger car service.....	(4021)
Railway express service.....	(4041)

#### RAILROADS

The undepreciated book value of tangible assets owned by railroads is equal to two-thirds of the total for all transportation industries. Within railroading, well over 90 percent of the assets are owned by railroads with operating revenues of \$3 million or more (class I). Our discussion of data availabilities in relation to objectives will revolve around class I roads, both line-haul and switching and terminal. These carriers report to the Interstate Commerce Commission on annual report form A.

Class II line-haul and switching and terminal railroads (operating revenues of less than \$3 million) report to the ICC on form C. Lessors of railroad properties report on form E. (These companies are treated as part of the real estate industry in the Standard Industrial Classification.) Electric railways, of which there are about two dozen, report annually to the ICC on form G. Some of them belong to major group 41, rather than major group 40, since they engage in local passenger operations. Finally, there are proprietary, circular, and unofficial roads. The first named are companies that have been practically absorbed by the parent operating company.

A small amount of investment data on proprietary companies appears in the reports of the operating class I or II roads. Circular roads include operating and nonoperating intrastate and private roads. There are fewer than 20 of these, operating less than 800 miles of track. No financial data are contained in their brief voluntary report to the ICC. Major circular roads include the Alaska Railroad, which owns 525 miles of road, and the State-owned (Georgia) Western & Atlantic Railroad operated by the L. & N. (134 miles). Unofficial roads are those from which no report (circular) was received by the ICC. In 1961 only two railroads, operating less than 40 miles of main track, were in this category.

Noted above is the fact that lessors of railroad properties are classified in the real estate industry. Because of our interest in these companies and the similarity of their reports to those of operating roads, we comment briefly on their report (form E) along with the report (form C) of the class II roads, and the report (form G) of electric



railroads. The three reports are abridged versions of the longer form A reviewed below. Our remarks on the need for information to supplement that contained in form A apply also to forms C, E, and G. Comparison of the latter reports with form A will indicate where data in addition to that collected from class I roads will be required.

We turn to the evaluation of form A as a data source. All companies reporting on this form are within the industry. (Complete coverage of the industry requires inclusion of roads reporting on form C and by "circular." At least two of the roads reporting on the latter form are owned by governments and their assets should be treated as government wealth. Private roads represent wealth of the sector of primary activity.

#### *Basic data on tangible assets*

Substantially all tangible assets owned by railroads are thrown into one of the following general balance sheet accounts (also identified by account number).

Materials and supplies.....	(712)
Road and equipment property.....	(731)
Improvements on leased property.....	(732)
Miscellaneous physical property.....	(737)

Other than total value, no detail on "Materials and supplies" (712) is found in form A.

Balances in "Miscellaneous physical property" (737) will be discussed in a later section.

The major portion of tangible railroad assets are recorded in "Road and equipment property." Of the \$33.4 billion of property shown in the above four accounts for class I roads in 1961, all but \$1.5 billion are in "Road and equipment property." (The \$1.5 billion are divided about equally among the remaining three accounts.) Road and equipment data are available in detail by more than 50 primary accounts (identified below). Balances in these accounts include both "Road and equipment property" (731) and "Improvements on leased property" (732). These primary accounts cannot be regrouped immediately into the recommended asset types for wealth estimates. "Engineering" (account 1) and "General expenditures" (71 to 77), and minor amounts in several other accounts have to be apportioned among the appropriate tangible-asset accounts. Additional information will have to be collected on "Miscellaneous equipment" to facilitate a distribution of value between freight and passenger carrying highway vehicles.

A further problem with the primary accounts is that they often distinguish assets on a functional rather than type-of-asset basis. For example, furniture and fixtures are included in the various "buildings" accounts. "Signals and interlockers" (27) includes buildings associated with train and traffic control. "Powerplants" (29) includes buildings and dams and canals related to power production by water.

We recommend study of the contents of these accounts to determine the relative importance of the functionally classified assets. This will serve to determine the extent to which the primary accounts will have to be adjusted as part of their regrouping into asset classes for wealth inventory purposes.

## ROAD AND EQUIPMENT PROPERTY ACCOUNTS FOR RAILROADS

- (1) Engineering.
- (2) Land for transportation purposes.
- (2<sup>1</sup>/<sub>2</sub>) Other right-of-way expenditures.
- (3) Grading.
- (5) Tunnels and subways.
- (6) Bridges, trestles, and culverts.
- (7) Elevated structures.
- (8) Ties.
- (9) Rails.
- (10) Other track material.
- (11) Ballast.
- (12) Track laying and surfacing.
- (13) Fences, snowsheds, and signs.
- (16) Station and office buildings.
- (17) Roadway buildings.
- (18) Water stations.
- (19) Fuel stations.
- (20) Shops and enginehouses.
- (21) Grain elevators.
- (22) Storage warehouses.
- (23) Wharves and docks.
- (24) Coal and ore wharves.
- (26) Communication systems.
- (27) Signals and interlockers.
- (29) Powerplants.
- (31) Power transmission systems.
- (35) Miscellaneous structures.
- (37) Roadway machines.
- (38) Roadway small tools.
- (39) Public improvements—construction.
- (40) Revenues and operating expenses during construction.
- (42) Reconstruction of road property acquired.
- (43) Other expenditures, road.
- (44) Shop machinery.
- (45) Powerplant machinery.
- (47) Unapplied construction material and supplies.
- (51) Steam locomotives.
- (52) Other locomotives.
- (53) Freight train cars.
- (54) Passenger train cars.
- (56) Floating equipment.
- (57) Work equipment.
- (58) Miscellaneous equipment.
- (59) Unapplied materials and supplies—equipment.
- (71) Organization expenses.
- (72) General officers and clerks.
- (73) Law.
- (74) Stationery and printing.
- (75) Taxes.
- (76) Interest during construction.
- (77) Other expenditures, general.
- (80) Other elements of investment.

*Location of assets*

Balance sheet data in form A are not distributed by State of location. Additional data should be collected to make possible the presentation of State-by-State data. We have noted elsewhere the problem of interstate vehicles.

*Assets rented to or from other sectors*

We deal here with properties used in the carriers' transportation operations. Miscellaneous properties, including their rental aspects, are taken up in the next section.

Form A contains a number of operating income and expense accounts related to rentals. Some accounts are supported by schedules. Most schedules describe the property, identify the lessor (lessee), and indicate the yearly rental payment (receipt). A description of the major accounts (and schedules) relating to rentals follows:

"Rents of buildings and other property" (142): Into this account are thrown rental receipts from those properties the operating expenses of which are not separable between the rented portion and the carrier-used portion. About \$20 million was recorded in this account in 1961. Form A contains no schedule to support this account.

"Miscellaneous rent income" (510): This account contains net rents of properties the expenses of which are separable and the value of which is included in road and equipment. The account is supported by schedule 372, showing the name and location of the property, the name of the lessee, and the amount of rent. The book value of the properties is not shown in the schedule. Net receipts in 1961 for class I railroads were \$43 million.

Rentals for rolling stock and joint facilities are thrown into one of the following accounts:

*Rent income:*

- Hire of freight cars (503).
- Rent from locomotives (504).
- Rent from passenger train cars (505).
- Rent from floating equipment (506).
- Rent from work equipment (507).
- Joint facility rent income (508).

*Rents payable:*

- Hire of freight cars (536).
- Rent for locomotives (537).
- Rent for passenger train cars (538).
- Rent for floating equipment (539).
- Rent for work equipment (540).
- Joint facility rents (541).

Schedules 376-78 support the first three classes of rental receipts shown above. Amounts received are separated between receipts from other carriers and receipts from noncarriers. Noncarriers are not identified. It is doubtful that any significant amount of rent is received from outside the railroad industry for these classes of equipment.

Turning now to rental payments for these same classes of equipment, the schedules noted above provide the same data on payments as for receipts. In 1961 all carriers considered as one system paid more than \$350 million in net rentals (rents payable less rental income) to non-carriers.

Class I railroads in 1961 paid out \$48 million on "Rent for leased roads and equipment" (542) and earned \$3 million in "Income from lease of road equipment" (509). Schedule 383 (371) supports this class of rental payment (receipt), and the schedule identifies the lessor (lessee), describes the property, and shows the amount of rent accrued. Properties leasing at less than \$50,000 per year are grouped. The book value of leased properties is not shown in the above schedules.

Accounts 536-41 (rental of equipment) and 542 (lease of road and equipment) do not contain all property rental payments. Various operating-expense accounts, e.g., "Outside agencies" (352), "General office supplies and expenses" (453), contain payments for rented offices and business machines. Form A has no supporting schedule for these accounts.

### *Miscellaneous physical properties*

Assets in this investment account (737) are defined as those tangible properties owned by a railroad but not operated in connection with its (or another carrier's) transportation service. Class I railroads carry about \$0.5 billion of these properties on their books.

Schedule 214 supports this investment account. Properties valued at \$1 million or more (or having a net profit or loss for the year of \$25,000 or more) are shown separately. The kind, location, and business use of each property are shown as well as the year of acquisition and book value.

"Miscellaneous physical properties" may be operated by the carrier or operated by others. Total revenues for operated properties (502) were \$44 million in 1961; net income from nonoperated properties (511) was \$32 million.

"Miscellaneous rents" payable (543) is supported by schedule 384 which identifies properties renting for \$50,000 or more by name and location. Properties shown in this schedule include some assets used in transportation as well as assets dedicated to nontransport purposes.

### *Physical unit detail*

A substantial portion of the investment of railroads is in structures below the railhead. One physical measure of this investment is miles of road, second and additional main track, yard track, and sidings, by State. Accordingly, we recommend presentation of supplementary physical detail on mileage. Schedule 412 of form A contains the following information by State.

- Road operated by respondent :
  - Line owned :
    - Main line.
    - Branch lines.
  - Line of proprietary companies.
  - Line operated under lease.
  - Line operated under contract.
  - Line operated under trackage right.
  - Total mileage operated.
- Line owned, not operated by respondent :
  - Main line.
  - Branch lines.

Rolling stock accounts for slightly more than 40 percent of railroad investment. We recommend the presentation of data on the number of units of this equipment by major types. Schedule 417 provides for each minor equipment type (shown in annex B) the following information:

- Units at close of year.
  - Owned and used.
  - Leased from others.
  - Total in service of respondent.
  - Aggregative capacity of units reported (tractive effort or capacity).
  - Leased to others.

Schedule 421 contains data on the number of vehicles owned or leased in revenue service and in nonrevenue service, by the following types:

- Trucks.
- Tractors.
- Trailers and semitrailers.
- Buses.
- Combination bus-trucks.

The number of leased vehicles is not shown separately.

#### *Revaluation of tangible assets*

The foregoing discussion has considered form A in the light of our requirements for book values and supplementary physical detail. It is obvious that considerable additional information will need to be collected if form A is to be the starting point for revaluation. Amounts in the various primary accounts would have to be distributed by age and State. In the absence of market prices for these assets, it would be necessary to construct price indexes for the various accounts. Survival curves also would have to be constructed since wealth should be measured on both gross and net bases.

There is an alternative to form A (as the point of departure for the revaluation of railroad assets) in the work of the ICC's Section of Valuation. The section prepares annual elements-of-value estimates of property owned or used by class I line-haul and switching and terminal railroads.

The following elements of value are prepared for each railroad.

1. Cost of reproduction new, except land and rights.
2. Cost of production new, less depreciation, except land and rights.
3. Original cost, except land and rights.
4. Present value of land and rights.
5. Working capital, including materials and supplies.

Before discussing the procedures followed in making reproduction cost estimates, we call attention to several facts about their scope. First, they currently cover class I roads only. Secondly, the section of valuation does not revalue those assets carried as miscellaneous physical properties. Finally, leased road and equipment are not separated from owned operating properties. Earlier, we noted that lessor companies are classified in the real estate industry.

Filling the gaps indicated by the first and second points would require collection of some additional information. Handling of the third problem could take one of two courses. In the final wealth

estimates, lessors of railroad properties can be shifted from real estate to railroad transportation. If this is not desirable, it will be necessary to develop a technique for isolating the values of leased road and equipment. Once valued, the property of lessors should be set out separately from the value of other industries within real estate.

Valuation estimates rest on three kinds of primary data. These are (1) the engineering report, (2) the annual reports submitted by carriers showing additions and retirements subsequent to the engineering report, and (3) a series of cost indexes.

The engineering report contains an enumeration, by detailed categories of physical units, of tangible assets owned or used by each carrier, by State and valuation section within each State, except equipment which is not allocated to any State. The physical inventories on which the engineering reports rest were completed between 1914 and 1922.

Regardless of the date when the inventory was completed, the physical units of roadway property of a given railroad were multiplied by prices appropriate to the particular railroad in the base period. The base-period unit prices reflected average costs during a 5- to 10-year period preceding June 30, 1914. In a few instances where roadway property records were adequate, original unit costs were used as multipliers. Equipment usually was priced at original cost. Most values in the overhead accounts were determined by applying fixed percentage rates to the dollar values in certain primary road accounts.

Two kinds of carrier reports are used in preparing current estimates of reproduction cost new. B.V. Form No. 588 is filed annually and records the units added or retired and their dollar values, resulting in a perpetual inventory. In the preparation of estimates by the short-form method discussed below, dollar value data on additions and retirements are taken from the carriers' annual reports (form A) to the ICC.

A variety of interrelated cost (price) indexes is used in revaluation. Underlying these indexes are price data collected from numerous sources, including reports by carriers and suppliers and trade publications. Prior to their use, these data are discussed by joint agency-industry price committees. Data adjustments resulting from the discussions of these price committees appear to be relatively few.

The indexes prepared by the Section of Valuation include the following:

1. Annual national indexes for each primary account, each weighted by the value (in base-period prices) of the components. Weights are shifted from time to time.
2. Annual regional indexes for each primary roadway account. The prices used are normally the same as those used in constructing the national indexes. However, prices are weighted by values appropriate to the particular region (of which there are eight).
3. Annual regional indexes for each primary equipment account. These are the same for each region. However, in constructing composite all-property and equipment indexes for a particular region the equipment accounts are weighted by values appropriate to the region.
4. A composite period index is constructed for each railroad, using an average of the three most recent annual regional indexes, and an

estimate of price levels during the present year and the year to come. The regional primary account indexes used in deriving the composite period indexes are weighted by values appropriate to the particular railroad.

Estimates of reproduction cost have been made using two methods. The long-form method was last applied to class I railroads during the period 1945-55. It has not been applied to class II roads since the 1930's.

Estimation of reproduction cost by this method involves adjusting the physical units remaining after the last application of the long-form method for subsequent additions and retirements. These new physical-unit balances are multiplied by the unit prices used in the engineering report. The resulting value of current inventory in base-period prices is revalued using the period indexes.

The short-form method currently is used for making revaluation estimates for class I only. The value estimates (in base-period prices) from the last long-form application are the starting point for a short-form estimate. All roadway property additions in a given year are deflated to the base-period price level using the appropriate regional index for all roadway property. Equipment additions in each primary account are deflated separately.

The age of retired roadway property and retired equipment in each primary equipment account is estimated using average life assumptions. When the average "vintages" of the dollar values retired in a given year have been determined, they are deflated.

Dollar balances of current inventory at base-period prices are revalued using the period indexes to obtain current dollar estimates.

#### *Summary*

Our review of the work of the Section of Valuation in those aspects which relate to wealth estimation leads to these conclusions:

The short-form method does not provide data at the State level nor at the level of the primary roadway account. The short form does not produce data as reliable as that from a long-form application. Over time, values gotten through the two techniques will diverge, particularly in the roadway property totals.

Long-form applications provide State data at the level of primary accounts. These applications, however, are expensive, and none is being made currently as part of any continuing program.

Given the foregoing facts, we recommend that resources be committed to the development of ways to overcome short-form data deficiencies. In addition, we recommend a further review of the 50 primary account indexes to determine their adequacy for purposes of wealth estimation.

#### OTHER INDUSTRIES WITHIN THE MAJOR GROUP

Elsewhere, we have recommended the grouping of data on the four industries making up railroad transportation. Line-haul railroads and switching and terminal companies were considered above. Discussed below are data availabilities for sleeping car and express companies.

Only a minimum quantity of data is filed with the Interstate Commerce Commission by the one sleeping car company. Book values for "Carrier property" (\$25 million in 1961) and "Materials and supplies" (\$11 million) were reported; the amounts were not further distributed by location or asset class. No amount was reported for "Other

physical property." "Interest rental on cars" and "Rental of cars to carriers" were reported as operating expenses or revenues. No other class of rentals is shown.

The total equipment in service at close of year distributed between owned and leased (from railroad carriers) is shown for these classes of equipment:

- Standard sleeping cars, lightweight.
- Standard sleeping cars, heavyweight.
- Tourist sleeping cars, other type.
- Other cars—slumbercoach.

An annual report is filed with the Interstate Commerce Commission by companies offering express service. Details about the report of the single large company in the industry will be discussed. (The report form filed by the one small express company shows only total investment in transport property.)

Real property and equipment investment is distributed among these accounts:

- Land.
- Buildings.
- Equipment:
  - Cars.
  - Automobiles.
  - Office furniture and equipment.
  - Office safes.
  - Trucks.
  - Garage equipment.
  - Line equipment.
  - Shop equipment.
  - Miscellaneous equipment.
  - Minor equipment.

Only rental payments for local office space are shown separately. The number of pieces of owned equipment is available for the following classes:

- Cars.
- Automobiles.
- Office safes.
- Car safes.
- Trucks.

We recommend collection of additional information in line with our data objectives.

#### IV. LOCAL AND SUBURBAN TRANSIT AND INTERURBAN PASSENGER TRANSPORTATION

##### *Group 41*

Local and suburban transit.....	(4111)
Local passenger transportation, not elsewhere classified.....	(4119)
Taxicabs.....	(4121)
Intercity buslines.....	(4131)
Intercity highway passenger transportation, not elsewhere classified....	(4132)
Local passenger transportation charter service.....	(4141)
Passenger transportation charter service, except local.....	(4142)
Schoolbuses.....	(4151)
Terminal and joint terminal maintenance facilities for motor vehicle passenger transportation.....	(4171)
Maintenance and service facilities for motor vehicle passenger transportation.....	(4172)



There are two Federal reporting systems for carriers within this major group. With exceptions to be noted, each of the reporting systems covers a part of each four-digit industry. Under those circumstances, data availabilities will be discussed without reference to specific covered industries. There should be no problem in assigning reporting firms to one of the two industry groupings recommended in chapter II.

The Interstate Commerce Commission and the Census Bureau operate the above Federal reporting programs. Neither collects any information on taxicabs (4121), schoolbuses (4151), nor terminal and service facilities for motor vehicle passenger transportation (4171-4172). Accordingly, we recommend the collection of necessary data from business units within these industries.

#### *The bus carrier survey*<sup>1</sup>

Coverage of business units in the remaining industries within the major group is good but not 100 percent. The bus carrier survey was a part of the 1963 Census of Transportation and collected data from all for-hire operators participating in the social security program. This results in the omission of business units operated solely by the owner, i.e., having no employees. Furthermore, since census coverage is limited to bus operators, no information was collected on local street railways and subways. (In our discussion of railroads, we noted that some electric roads reporting to the ICC belong in major group 41.) We recommend collection of required data from street railway and subway operators in future surveys.

Since the bus carrier survey did not collect any balance sheet data, we also recommend the collection of the balance sheet data by asset types. Data should also be collected on leased assets.

The number of owned and leased buses, classified by seating capacity was reported on the 1963 questionnaire. We recommend the presentation of supplementary physical detail on the number and capacity of buses. A separation should be made between those owned and those leased.

The 1963 Census of Transportation collected a minimum of information from regulated bus carriers. These report annually to the ICC on form D or form E. The former report is used by class I carriers, defined as those having gross operating revenues of \$200,000 or more. Smaller carriers use one of two versions of form E. Those with operating revenues of less than \$50,000 report practically the same information called for in the 1963 census questionnaire. Accordingly, our comments and recommendations made in connection with the latter report apply also with respect to the version of form E filed by carriers with operating revenues totaling less than \$50,000.

Nonclass I firms with operating revenues of at least \$50,000 complete the balance sheet and income statements found in form E. Relevant balance sheet accounts include:

Materials and supplies.

Revenue equipment.

Other carrier property.

Noncarrier property.

Additional information is required as the basis for distributing the values in the latter three accounts among the recommended asset classes for wealth purposes.

<sup>1</sup> The full name of this Census program is the "Truck and Bus Carrier Survey."

The income statement does not show separately rental payments and receipts. The amount of rentals and the value of assets rented to other business units should be collected.

*Report form for large carriers*

Considerably more data is available about carriers reporting on form D. Balance sheet accounts include:

- Materials and supplies (1180).
- Carrier operating property (1200).
- Carrier operating property leased to others (1300).
- Noncarrier operating property (1400).
- Nonoperating property (1450).

Additional information is available in supporting schedules for each of these accounts except "Materials and supplies."

The following primary accounts exist for carrier operating property in schedule 1200:

- Land and land rights.
- Structures.
- Revenue equipment.
- Service cars and equipment.
- Shop and garage equipment.
- Furniture and office equipment.
- Miscellaneous equipment.
- Improvements to leasehold equipment.
- Undistributed property.
- Unfinished construction.

The "Revenue equipment" account is supported by schedule 1221. The following information is provided for each vehicle or group of identical vehicles:

- Make.
- Year.
- Number of units.
- Local or intercity use.
- Gasoline, diesel, or other engine.
- Passenger seating capacity of each vehicle.
- New or used.
- Cost.

The above accounts (supplemented by the equipment schedule) can be cast into the recommended asset classes for wealth purposes after the collection of a minimum of additional data for some accounts. "Service cars and equipment" includes automobiles as well as work or roadside assistance equipment, and these should be separated. Improvements to leasehold properties should be distributed among the remaining asset classes.

The name of the lessee and the book value of each carrier operating property leased to others are recorded in schedule 1300. The carrier is required to maintain (although he does not report) this investment account by the same accounts used for "Carrier operating property."

Rental receipts (payments) for leased operating properties are recorded in schedule 5500 (5400). The schedule identifies the lessee (lessor) and the amount of rent receivable (payable). Receipts and payments recorded in schedules 5500 and 5400 refer to rental of distinct operating units and include the use of an operating right or franchise. Since the latter is an intangible and outside our definition of wealth, the

rentals must be adjusted to exclude amounts associated with the use of franchises.

Rental receipts and payments for operating property other than those associated with the lease of franchises are recorded in schedule 5300. The following detail is available on rental receipts and payments:

- Equipment rents
- Other operating rents
- Joint facility rents

When both parties to a rental transaction are part of the same industry, it is unnecessary to develop payments data.

The "Noncarrier operating property" and "Nonoperating property" accounts are supported by schedules 1400 and 1450 respectively. In each schedule the book value of each property within the accounts is reported along with a summary description of the property and its use. Data are needed with which to distribute the values by asset types. Rental revenues from nonoperating properties are shown in schedule 6100.

The revenue equipment schedule mentioned in our review of value data by asset classes provides information needed to distribute vehicle units by capacity. We already have recommended that such a distribution be made for the vehicles of firms covered by the census of transportation.

The revenue equipment schedule also groups vehicles by maker and model year along with the associated book values, all necessary data for revaluation. A sample of aged book values is required for other asset classes along with appropriate price indexes and survival curves on which to base depreciated values. The alternative possibility of using market prices to arrive at net values for revenue equipment should not be overlooked.

Neither form D nor form E distributes asset values by State of location. We recommend collection of these data.

## V. MOTOR FREIGHT TRANSPORTATION AND WAREHOUSING

### *Group 42*

Local trucking and draying, without storage.....	(4212)
Trucking, except local.....	(4213)
Local trucking and storage, including household goods.....	(4214)
Farm product warehousing and storage.....	(4221)
Refrigerated warehousing, except food lockers.....	(4222)
Food lockers, with or without food preparation facilities.....	(4223)
Household goods warehousing and storage.....	(4224)
General warehousing and storage.....	(4225)
Special warehousing and storage, not elsewhere classified.....	(4226)
Terminal and joint terminal maintenance facilities for motor freight transportation.....	(4231)

Three Federal statistical programs cover the greater part of this major group. The Interstate Commerce Commission receives reports from carriers within its jurisdiction. The truck carrier survey is part of the 1963 Census of Transportation.<sup>1</sup> Public warehousing is covered

<sup>1</sup> The full title of the program is the "Truck and Bus Carrier Survey." Another program within the census of transportation is the "Truck Inventory and Use Survey," based on a sample of 100,000 highway power units. The data from the latter program will supplement information from vehicle owners.

by the quinquennial census of business. (Since trucking companies in industry 4214 also engage in storage, there is some overlapping coverage by the three reporting systems.)

Before turning to an evaluation of the kinds of data collected for trucking and warehousing, we call attention to the absence of a reporting vehicle for one small industry "Terminal and joint terminal maintenance facilities for motor freight transportation" (4231).

#### *Public warehousing questionnaire*

The census questionnaire for public warehousing is sent to establishments with one or more employees. No data are collected from business units without employees. The form used in the 1963 Business Census does not request information on the value of tangible assets. We recommend the collection of this investment data by the asset classes recommended in chapter II. A sampling of the values reported by year of acquisition will be necessary for revaluation. Since a report for an establishment refers to activities in only one place, there should be no problem in determining the State in which tangible assets are located.

We recommend also the collection of data on rental payments, rental receipts, and the value of assets rented to other business units, by major asset classes.

The 1963 census questionnaire requests information on the amount of public storage space available for various classes of commodities, i.e., household goods, general merchandise, refrigerated goods, etc. We recommend presentation of this supplementary physical detail along with the wealth estimates.

#### *Truck carrier survey*

Coverage of the motor trucking industries by the truck carrier survey (a stratified random sample based on about 20 percent of the universe) is limited to those business units with employees. If wealth data were collected from this universe it would understate the value of tangible assets devoted to motortrucking, since sole-owner operators are common in this industry. However, the understatement probably would not be significant.

The data collected by the truck carrier survey are similar to those reported to the ICC by class III carriers with annual operating revenues of less than \$50,000. Neither set of data includes information on investment in tangible assets. Accordingly, we recommend the collection of data on rental payments, rental receipts, and the value of assets rented to other business units, by major asset classes.

Both the census questionnaire and the above ICC report (form C) request data on the number of owned vehicles, by type, i.e., trucks, truck tractors, semitrailers, and full trailers. We recommend presentation of this supplementary physical detail.

Those class III carriers with annual revenues of \$50,000 but less than \$200,000 (which is the upper limit for the class) report investment data in addition to the vehicle information noted above. The investment reported includes:

- Materials and supplies.
- Revenue equipment.
- Other carrier property.
- Noncarrier property.

Additional detail is required in order to distribute the amounts in the latter three accounts among the asset classes set out in chapter II. Information also is required on rental payments, rental receipts, and the value of assets associated with the rental receipts, by major asset class.

*Report form for medium-sized carriers*

Class II motor carriers, defined as those having annual operating revenues of \$200,000 but less than \$1 million, report to the ICC on annual report form B.

The book costs of the tangible assets of class II carriers are recorded in these three balance sheet accounts:

Material and supplies (118).

Carrier property (120).

Noncarrier property (140).

The latter two accounts are supported by schedules. The following detail is available in schedule 120 for "Carrier property":

Land and structures.

Revenue equipment.

Service cars and equipment.

Other carrier property.

Except for the "Revenue equipment" account, more detail is needed to distribute recorded values by the asset classes recommended in chapter II. Information on the location of these assets as well as a sample of aged values, also, are required.

The following data on "Revenue equipment" are available from schedule 122 (material cited is from the 1962 report):

**TRUCKS**

*Make*

Number:

Number by year of manufacture:

Prior to 1955.

1955 through 1960.

1961.

1962.

Number by type of engine:

Gasoline.

Diesel.

Other.

Number by type of body:

Rack and flat bed.

Refrigerator.

Tank.

Other.

Number by number of axles:

One axle.

Two axles.

Three axles.

Other.

Number used principally in—

Intercity service.

Local service.

Cost.

The same detail (where applicable) is available for truck tractors, semitrailers, and full trailers.

The data provide (1) value detail which can be cast immediately into the recommended asset classes; (2) the number of each make of vehicle type classified by a number of characteristics, information necessary for presentation of supplementary physical detail. For revaluation purposes, however, a sample of costs should be redistributed by year or period of manufacture.

"Noncarrier property" is supported by schedule 140. In addition to showing the book value, each property is described and its use is indicated. Data are required with which to distribute the value of each property by asset classes and by State of location. Values in each asset class should be sampled to determine asset age.

Rental receipts (and payments) for noncarrier properties are included within total revenues (expenses) associated with noncarrier operations (schedule 610). The rental receipts should be separated and the book value of the associated rented properties determined.

Carriers may lease portions of their operation to other carriers. This involves the use of the operating right or franchise (carried in one of the intangible property accounts) and carrier property (carried in account 120). Rentals receivable from the lessee (shown in schedule 550) include remuneration for use of the franchise. The book value of the leased carrier property is not shown separately.

Rental payments (and receipts) for carrier properties, other than distinct operating units, are recorded in a number of expense accounts, e.g., "Other maintenance expenses" (418), "Purchased transportation" (427), "Other transportation expenses" (418), "Other terminal expenses" (438), etc. Except for "Purchased transportation" the amount of rental payments (receipts) is not shown separately nor is the class of asset identified. Rental payments should be associated with particular asset types.

We call attention to the fact that many of the rental receipts and payments discussed above relate to assets both owned by and used by the motor carrier industries as we have defined them for wealth purposes. When this is found to be true, there is no need for developing data about rental payments and receipts or the value of rented properties. The rental of distinct operating units as well as vehicles rented with drivers (one class of "Purchased transportation") illustrates assets which are both owned and used within the industry.

#### *Report form for large carriers*

Annual report form A for class I carriers, defined as those with operating revenues of \$1 million or more, is an expanded version of the report used by class II carriers and discussed above.

Tangible assets are thrown into the following balance sheet accounts:

- Material and supplies (1180)
- Carrier operating property (1200)
- Carrier operating property leased to others (1300)
- Noncarrier property (1400)

(Some miscellaneous tangibles are also recorded in "Other current assets" (1190).) The latter three accounts are supported by schedules. Schedule 1200 provides value data distributed by these accounts:

- Land and land rights
- Structures
- Revenue equipment
- Service cars and equipment
- Shop and garage equipment
- Furniture and office equipment
- Miscellaneous equipment
- Improvements to leasehold property
- Undistributed property
- Unfinished construction

Additional information should be gathered about "Service cars and equipment" to separate automobiles from the work vehicles included in the subaccount. The book costs recorded in "Improvements to leasehold property" should be distributed among the other accounts.

Schedule 1300 supports "Carrier operating property leased to others." Along with the identity of the lessee, the schedule shows the book value of the tangible property associated with each distinct operating unit under lease. The amounts in this account should be distributed among the accounts used for operating property. While this distribution is not reported, carriers are required to maintain this detail in their accounting records.

Rental receipts from a distinct operating unit (which includes the use of a franchise and physical properties) are shown in schedule 5500. (Rental payments for the use of property constituting a distinct operating unit are recorded in schedule 5400.) We already have pointed out that these operating units are both owned and used within the trucking industries.

"Noncarrier properties" are identified in schedule 1400. The book value of each is shown along with the purposes for which used. Information is required with which to distribute these values by asset class. Rental receipts (and payments) arising in connection with non-carrier operations are recorded in schedule 6100. These rentals are not separated from the total revenues and expenses shown, nor associated with each distinct noncarrier operation. The allocation of assets to the sector of use will be made on the basis of rental receipts and payments. Accordingly rentals should be separated from total non-carrier revenues (and expenses) and associated with the relevant book values.

Net rentals involving assets used in carrier operation are shown separately in "Operating rents" subaccounts within each of the six major operating and maintenance expense accounts. Separate data on rental receipts (and the value of the rental properties) and rental payments (and the kind of property rented) are required as the basis for allocation of rental properties to the appropriate sector of use.

"Purchased transportation" which involves rented revenue equipment is supported by schedule 4270. Receipts and payments are separately shown. In addition, rentals of equipment without driver are separated from rentals of equipment with drivers. We already have noted that rentals of equipment with drivers should cancel out within the trucking industries since both lessor and lessee are classified with-

in the industries. However, some equipment rented without drivers is owned outside the trucking industries.

None of the investment data reviewed above provides information on the location of the asset nor on the age of the assets. We recommend the collection of such data.

In our review of form B (used by class II carriers), we noted the kind of physical-unit data available for revenue equipment. The same information is available for vehicles owned by class I carriers. We recommend the presentation of supplementary physical detail showing the number of vehicles by type.

## VI. WATER TRANSPORTATION

### *Group 44*

Deep sea foreign transportation.....	(4411)
Transportation to and between noncontiguous territories.....	(4421)
Coastwise transportation.....	(4422)
Intercoastal transportation.....	(4423)
Great Lakes-St. Lawrence Seaway transportation.....	(4431)
Transportation on rivers and canals.....	(4441)
Ferries.....	(4452)
Lighterage.....	(4453)
Towing and tugboat service.....	(4454)
Local water transportation, not elsewhere classified.....	(4459)
Piers and docks.....	(4462)
Stevedoring.....	(4463)
Canal operation.....	(4464)
Water transportation services, not elsewhere classified.....	(4469)

### DEEP SEA CARRIERS

We will first consider those companies engaged in deep sea foreign and domestic transportation. Three Federal agencies collect data from deep sea operators. Coverage of domestic deep sea operators is very good although not 100 percent. There is poor coverage of those engaged in foreign commerce. Accordingly, it will be necessary to establish new data collection arrangements.

The three agencies which receive information from a part of the industry are the Federal Maritime Commission, the Interstate Commerce Commission, and the Maritime Administration. Their reports are identified respectively as forms "FMC-64", "M", and "MA-172". Each form consists of a core of common schedules plus certain schedules required by only one or two of the agencies. In our review of currently collected data we shall treat the three reports as one. Before reviewing the report(s) we will note the gaps in coverage of the four deep sea industries.

Only about one-third of the 200 deep sea carriers report to one or more of the three agencies. The Maritime Administration receives reports from 15 subsidized carriers engaged in foreign commerce. These few carriers own nearly one-third of the privately owned merchant fleet. The remaining carriers engaged in foreign commerce do not report to any agency unless, as noted below, they also engage in domestic commerce. These companies include regular route (liner) and charter (tramp) operators as well as companies operating ships primarily for the transportation of their own products (industrial carriers). Of course, the assets of the latter belong to the industrial sector of primary activity.



About four dozen domestic carriers (some of which also engage in foreign commerce) report to the Federal Maritime Commission. (Perhaps one-third of these carriers operate non-self-propelled vessels, and accordingly they report on form FMC-63 rather than FMC-64.) The four dozen carriers include all *common* carriers operating between the mainland and noncontiguous territories (Industry 4421) and those coastwise carriers operating within Puerto Rico (part of Industry 4422).

About two dozen domestic carriers report to the ICC including a dozen or so that also report to FMC. Some of these carriers also engage in foreign commerce. They include all coastwise carriers except those operating within Puerto Rico (regulated by FMC), and Alaska and Hawaii (within the jurisdiction of the respective States). Also reporting to ICC are those carriers engaged in intercoastal transportation (Industry 4423).

There are three fleets of deep-sea vessels the assets of which are not part of the transportation industries. We already have mentioned the industrial carriers which are engaged in transporting their own products. The wealth of the Government-owned reserve fleet is treated in the Federal Government accounts. Finally, there are the 400 foreign-flag vessels owned by foreign subsidiaries of American companies. The tangible wealth of this flags-of-convenience fleet will enter into the sector account constructed for net foreign claims.

We now review the report(s) prepared by deep-sea shipping companies. The general balance sheet contains the following accounts relating to tangible assets:

- Inventories (170).
- Floating equipment—vessels (331).
- Other floating equipment (337).
- Terminal property and equipment (343).
- Other shipping property and equipment (349).
- Nonshipping property and equipment (353).
- Construction work in progress (359).
- Spare parts (362).

Schedules provide more detailed information about each account. Schedule 200, completed by MA and FMC respondents only, refers to "Inventories," and it separates them into the following subaccounts:

- Vessel stores, supplies, and equipment ashore.
- Other shipping inventories.
- Nonshipping inventories for sale.
- Nonshipping inventories for consumption.
- Miscellaneous inventories.
- Bar.
- Slop chest.

Location and description are given for each item valued at \$10,000 or more.

The book value of each vessel carried in account 331 is shown in schedule 2020.

The book value of each major item of property in the remaining balance sheet accounts (except "Spare parts") is shown in schedule 2022. Items are identified and grouped within each balance-sheet account. The location of the item also is given. The "Spare parts"

account is supported by schedule 2031, completed by MA and FMC respondents only. Each item valued at \$10,000 or more is identified, and its location and book value are given. The above schedules appear to provide necessary information on the location of assets. This leaves as the only major data gap a sampling of aged book costs for assets other than vessels.

Needed information for the revaluation of vessels is available in schedule 4010. The following data are given for each vessel:

Year built.

Year acquired.

Type.

Gross tonnage.

Deadweight tonnage.

Cubic capacity (feet):

Bale.

Bulk.

Certificated passenger carrying capacity.

Indicated horsepower of engines.

Usual rate of speed (knots).

Length overall.

Beam overall.

Maximum draft:

Light.

Fully loaded.

Number of persons in crew.

In connection with the development of wealth estimates for deep sea shipping, we call attention to the technical resources of the Maritime Administration in the areas of ship construction costs and the used-vessel market.

#### INLAND CARRIERS

About 200 common and contract water carriers engaging in commerce on the Great Lakes and on inland waterways report to the Interstate Commerce Commission. This total does not include all carriers falling within industries 4431 and 4441. Among the exclusions are intrastate carriers as well as companies engaged in the exclusive operation of vessels carrying not more than three commodities in bulk. It will be necessary to establish a data collection arrangement. In connection with the task of identifying carriers not reporting to the ICC, we call attention to the Corps of Engineers "Transportation Lines" series. These annual publications identify all U.S. business units engaged in water transportation, including not only those operating on the Great Lakes and inland waterways but also many of those engaged in local water transportation as well as the deep sea carriers already discussed.

Companies with operating revenues exceeding \$100,000 and reporting to the ICC use annual report form K-A. (The same form—but identified as FMC-63—is used by tug and barge lines under the jurisdiction of the Federal Maritime Commission.)

ICC regulated carriers with revenues less than \$100,000 report on form K-C. The latter report does not distribute assets by type. The only separation made is between the book values of shipping and non-

shipping property and equipment. The following information is provided for each piece of floating equipment:

- Character of title (owned or leased).
- Year acquired.
- Rated horsepower of engine.
- Cargo carrying capacity tons.
- Passenger carrying capacity (number).

Form K-A contains the following balance sheet accounts relating to tangible assets:

- Material and supplies (115).
- Transportation property (140).
- Improvements on leased property (158).
- Noncarrier physical property (160).

The latter three accounts are supported by schedules 222 and 287. The former provides the following distribution of balances in "Transportation property" and "Improvements to leased property" accounts:

- Floating equipment:
  - Line equipment.
  - Harbor equipment.
  - Miscellaneous floating equipment.
- Terminal property and equipment:
  - Buildings and other structures.
  - Office and other terminal equipment.
  - Motor and other highway equipment.
- Land and land rights:
  - Land.
  - Public improvements.
  - Construction work in progress.

The physical characteristics of each piece of floating equipment (or groups of like vessels) are presented in schedule 413. The detail includes:

- Year built.
- Year acquired.
- Character of title.
- Service for which adapted.
- Cargo dead weight carrying capacity.
- Cubic capacity (feet):
  - Bale.
  - Bulk.
- Certificated passenger carrying capacity.
- Rated horsepower of engines.
- Usual rate of speed.
- Length overall.
- Beam overall.
- Maximum draft:
  - Light.
  - Fully loaded.
- Equipped with radio apparatus.
- Number of persons in crew.

Schedule 287 is used to record investments in noncarrier properties. The identity, location, date of acquisition, and book cost are shown for each property valued at \$5,000 or more. If the property items so described are not too gross, i.e., composed of extremely hetero-

geneous asset types, sufficient data are available to provide a basis for revaluation and the geographic allocation of the resulting estimates.

Rental receipts and payments for the charter of vessels are thrown into accounts 341, 481 respectively (schedules 310, 320). The book value of vessels chartered is not shown.

Accounts 342 and 483 are used to record rental received and paid for transportation properties leased for a period of 1 year or more. Schedules 371 and 381 identify properties rented for a year or more, their location, and the amount of rent accrued.

Rental receipts and payments in connection with noncarrier physical properties are thrown into "Income from noncarrier operations" (account 502). The annual report contains no further information on these rentals. It will be necessary to relate rental receipts and payments to specific asset types. Further, rental receipts must be matched with the value of properties described in schedule 287, which supports noncarrier investment.

#### LOCAL WATER TRANSPORTATION

Business units engaged in local water transportation do not file reports with the ICC unless they happen also to perform transportation in interstate or foreign commerce. Elsewhere, we have noted the annual Corps of Engineers "Transportation Lines" series which should be useful in identifying most local water units. Lists of employers prepared in connection with the social security program may also be helpful in identifying these local units. We recommend collection of required data.

#### SERVICES INCIDENTAL TO WATER TRANSPORTATION

Data of the type required for wealth-measurement purposes are not collected from business units within this group of industries by any Federal agency. We note the interest of two Federal agencies and two private organizations in some or all of the industries within the group. The Corps of Engineers and Maritime Administration jointly prepare publications describing in detail port facilities on the Great Lakes and the several coasts. The "Lake Series" and "Port Series" contain port surveys made on a rotating basis over a number of years.

The port of New York periodically collects data on capital expenditures for deep sea terminal facilities made in principal ports of the United States. In 1963 the American Association of Port Authorities completed a survey of member-owned facilities. Estimates were made of the cost of the facilities as well as gross and net replacement values. The assets of these public authorities, of course, are a part of the wealth of State and local governments. We call attention to the efforts of this association and the other named agencies since we believe each could contribute to the development of plans for the collection of data from privately and publicly owned units engaged in operating piers and other water services. We recommend the collection of needed data from economic units within these industries.

## VII. TRANSPORTATION BY AIR

*Group 45*

Air transportation, certificated carriers <sup>1</sup> -----	(4511)
Air transportation, noncertificated carriers <sup>1</sup> -----	(4521)
Airports and flying fields-----	(4582)
Airport terminal services-----	(4583)

<sup>1</sup> When revisions in the SIC occur, the title of industry 4511 should be amended to read "certificated route carriers"; the title for industry 4521 should read "certificated supplemental and noncertificated carriers." The suggested titles reflect changes in CAB certification practices.

Industry 4511 consists of carriers holding certificates of public convenience and necessity pursuant to section 401(d) (1) or (2) of the Federal Aviation Act of 1958, as amended, authorizing them to engage in air transportation over a route, or routes, designated by the Civil Aeronautics Board.

Each carrier files report form 41 with the CAB. This is basically a quarterly report, although some of its schedules are filed monthly and others are completed annually. The form is reviewed below in the light of data objectives.

*Value data by asset class*

The values of operating property and equipment are thrown into the following accounts:

## Flight equipment:

- Airframes.
- Aircraft engines.
- Aircraft propellers.
- Aircraft communication and navigational equipment.
- Miscellaneous flight equipment.
- Improvements to leased flight equipment.
- Flight equipment rotatable parts and assemblies.

## Ground property and equipment:

- Passenger service equipment.
- Hotel, restaurant, and food service equipment.
- Ramp equipment.
- Communication and meteorological equipment.
- Maintenance and engineering equipment.
- Surface transport vehicles and equipment.
- Furniture, fixtures, and office equipment.
- Storage and distribution equipment.
- Miscellaneous ground equipment.
- Maintenance buildings and improvements.
- Other buildings and improvements.

## Land.

## Construction work in progress.

Rearrangement of these accounts into the recommended wealth groupings will require some additional information from the carriers. For example, surface transportation vehicles need to be distributed among the various established classes.

The flight equipment accounts contain some aircraft components not currently installed on aircraft, e.g., aircraft engines and communication and navigational equipment. The assets making up "Flight equipment rotatable parts and assemblies" are defined to exclude

installed components. In constructing a value for the wealth grouping "airplanes," we suggest omitting rotatable parts and assemblies, treating them as "other equipment." Whether or not to attempt separation of uninstalled components from the installed components in the other accounts will depend on the significance of the distortion introduced by inclusions of the uninstalled components in the total for "aircraft."

Besides "Operating property and equipment," the detail of which is shown above, three other balance sheet items reflect data on tangible assets. These are "Flight equipment expendable parts," "Miscellaneous materials and supplies," and "Nonoperating property and equipment."

#### *Rental data*

Rental payments for property used in transportation service are totaled separately within the several major operating expense accounts. Rental receipts for transportation properties are shown separately in account 4611. Rental payments for nonoperating properties identified with nontransport ventures, and rental receipts from nonoperating properties are included within "Income from nontransport ventures" (8186). Rental payments for nonoperating properties not identified with nontransport ventures are included within "Miscellaneous nonoperating debits" (8189). Additional information will have to be collected to identify the kind of property rented, the associated rentals, and the book value of property leased to others.

#### *State data*

The report of the carriers to the CAB does not distribute asset values by State. We have noted elsewhere the difficulty of making a meaningful allocation of aircraft among States. However, it is desirable to show assets other than aircraft on a State basis.

#### *Other air carriers*

Industry 4521 consists of supplemental carriers holding certificates of public convenience and necessity issued under section 401(d)(3) of the Federal Aviation Act of 1958, as amended, or a special operating authorization issued under section 417 of the Federal Aviation Act, or operating authority issued pursuant to section 7 or 9 of Public Law 87-528. Industry 4521 also includes noncertificated commercial operators and for-hire commercial flying within general aviation.

Commercial operators consist of contract carriers and intrastate common carriers. Neither is regulated by the CAB. Both hold commercial operator certificates from the Federal Aviation Agency as evidence of their fitness from a safety standpoint to operate for-hire aircraft of more than 12,500 pounds. For-hire operators of aircraft weighing 12,500 pounds or less are classified by the FAA in general aviation, a category which includes all civil flying except the above-mentioned CAB regulated carriers and the commercial operators.

Neither of the aviation agencies has a list of operators within general aviation. Those who participate in the social security program could be identified from the records of the Bureau of Old Age and Survivors Insurance. A partial listing of air taxi and scheduled intrastate operators of aircraft weighing 12,500 pounds or less is shown in the "Official Airline Guide." The National Air Taxi Conference

(Washington, D.C.) may be able to assist in the identification of additional operators. The total assets of these carriers are small and perhaps insignificant in relation to total air transportation.

A list of commercial operators is maintained by FAA and published quarterly in "The U.S. Civil Air Carrier Fleet." In late 1962, there were 41 operators.

Required information from commercial operators and for-hire businesses within Federal aviation (once the latter are identified) might be collected by the FAA (the Agency does not now collect financial data but does license pilots and aircraft); or the CAB, which is experienced in collecting financial data, but has no regulatory responsibilities in this area; or the Census Bureau.

Supplemental carriers file an abbreviated form 41 with the CAB. The following balance sheet items are reported by supplemental carriers:

- Flight equipment expendable parts.
- Miscellaneous materials and supplies.
- Flight equipment.
- Ground property and equipment.
- Land.
- Construction work in progress.
- Nonoperating property and equipment.

The shortened form 41 does not contain a schedule supporting the balances recorded for "Flight equipment" and "Ground property and equipment." Since the balance sheet cannot be immediately reclassified into the recommended asset classes, additional detail will need to be collected from supplemental carriers. (See the earlier discussion of value data by asset class relative to certificated route carriers.)

Only rentals paid for operating properties are reported by supplemental carriers. Rental receipts from operating properties and rentals in connection with nonoperating properties are not separately reported. The properties are not identified.

The reports filed by the supplemental carriers do not distribute asset values by State of location. It will be necessary to collect this information for assets other than aircraft.

Our discussion of data availabilities in the light of objectives has treated, first, the certificated route carriers; next, the noncertificated carriers; and lastly, the certificated supplemental carriers. Now we will discuss these carriers as a group in connection with physical unit detail.

Since flight equipment accounts for most of the tangibles owned by carriers, we recommend the presentation of supplementary physical detail showing number of aircraft, distributed between turbine- and piston-driven planes, further divided by number of engines. It would also be useful to indicate maximum seating capacity for each class of aircraft. It is desirable to cross-classify each class of aircraft by year of manufacture.

There is available considerable information on aircraft and their characteristics. All aircraft are registered with the FAA. Information of the sort in which we are interested (make, model, etc.) is available from the registration and related records and is being published currently in the Agency's annual "Statistical Study of U.S. Civil Aircraft" and "The U.S. Civil Air Carrier Fleet," a quarterly release.

Certificated route and supplemental carriers additionally report the following selected data to CAB (schedule B-43) :

#### INVENTORY OF AIRFRAMES AND AIRCRAFT ENGINES

Date acquired.  
 Maximum seating configuration.  
 Manufacturer.  
 Number of aircraft engines (by type).  
 Type, model, and cabin design.  
 Maximum continuous horsepower per aircraft engine.  
 Cost.  
 Reserve for depreciation.  
 Estimated residual value.  
 Estimated depreciated life (months).

#### AIRPORT AND TERMINAL SERVICE INDUSTRIES

Industry 4582 consists of airport operators and business units engaged in servicing, repairing, and storing aircraft at airports. All fields open to the public and some private fields are either inspected annually by the FAA or information about them is submitted by the owners to the FAA. Information about inspected fields is recorded on the "Airport Facilities Record," form 29-A. Form 29-A.1 is used by self-reporting owners. The two reports describe in some detail the landing area and the field's terminal facilities. No financial data are collected.

The reports can be used in two ways. They provide a possible vehicle for the collection of required additional information from airport operators, although we note that FAA does not have a primary interest in financial data. Alternatively, a list of airports filing the report provides a frame for the collection of data by another agency. The frame is good although not perfect. It includes publicly owned airports, the value of which is assigned on sector basis to one of the Government sectors. It also includes some private fields operated by other industries.

Industry 4582 includes not only airport operators but business units servicing aircraft. The airport reports filed with FAA do not identify these units; however, since the reports now ask for the number of fixed-base operators (which includes these units) it would be possible to ask for the names of these firms as a part of the airport report.

Industry 4583 consists of business units furnishing airport terminal services, e.g., airfreight handling, hangar rentals, etc. There is no reporting program at the Federal level for companies in this industry. We recommend the collection of required data from firms in this industry. A list might be developed through the airport report.

### VIII. PIPELINE TRANSPORTATION

#### Group 46

Crude oil pipelines..... (4612)  
 Refined petroleum pipelines..... (4613)

We believe these industries should include pipeline *departments* as well as pipeline companies. Whether department or company, the industries should be restricted to common carriers. Pipeline assets



dedicated to the exclusive use of a producing or refining company belong in the appropriate mining or manufacturing industry.

Common carriers by pipeline report to the Interstate Commerce Commission on annual report form P. Coverage of the industry by ICC is substantial but not 100 percent. Excluded are a few intrastate common carriers. The Bureau of Mines, which collects pipeline mileage and related data, maintains a list of companies owning pipelines, and identification of the intrastate common carriers should present no problem. Collection of required data from these companies might be made by the Bureau of Mines, which has established contacts with the carriers but does not now collect financial data; the ICC which collects financial data from the bulk of the industry but presently has no statutory authority to collect data from nonregulated companies, or the Bureau of the Census. Annual report form P now will be evaluated as a data source in the light of objectives.

With some exceptions, the primary investment accounts (shown below) can be rearranged into the recommended asset classes.

Gathering lines:

- Land.
- Rights-of-way.
- Line pipe.
- Line pipe fittings
- Pipeline fittings.
- Pipeline construction.
- Buildings.
- Boilers.
- Pumping equipment.
- Machine tools and machinery.
- Other station equipment.
- Oil tanks.
- Delivery facilities.
- Communications systems.
- Office furniture and equipment
- Vehicles and other work equipment.
- Other property.

Trunk lines: Same as above.

General:

- Land.
- Buildings.
- Machine tools and machinery.
- Communications systems.
- Office furniture and equipment.
- Vehicles and other work equipment.
- Other property.
- Construction work in progress.
- Unadjusted investments.
- Acquisition adjustment.

No primary account exists for wharves and docks, these assets being grouped with items in "Delivery facilities." Vehicles and other work equipment are entered in a single account. Rights-of-way in this industry should be treated the same as owned land, since the former typically are leased in perpetuity or vested in the pipeline company by virtue of a property easement.

Balance sheet accounts exist for "Operating oil supply" and "Materials and supplies," and "Miscellaneous physical property." The first two accounts are not supported by schedules.

A separate schedule is used to describe miscellaneous physical properties valued at \$25,000 or more. These properties are divided in turn between operated and nonoperating (business units leased to others) properties. Revenues are shown from each separate rental property.

Rental payments for property used in transportation service are itemized separately if the payment equals or exceeds \$5,000. The location and description of the property are given.

The annual report does not contain any separation of values by State of location. One of the "elements of value" (discussed below) prepared by the ICC's Section of Valuation is original cost. Original cost which is closely related to book value is available by primary account within each State. Similar detail is available for land.

For each reporting company, physical data on pipelines owned and operated by respondent (also, owned in undivided interest and operated by respondent, and owned by others and operated by respondent) are available in the following detail by State:

- Miles and size of gathering line.
- Miles and size of crude oil trunklines.
- Miles and size of refined oil trunklines.

#### *Asset revaluation*

In connection with the restatement of book values in current dollars, we call attention to the estimates prepared for pipelines by the Section of Valuation, ICC. Their work will be described and limited comments made. Limitations on time and technical resources have precluded the sort of study that could lead to a definite conclusion concerning the usefulness of their estimates for wealth purposes. We do recommend that the Section's techniques and estimates be fully evaluated as the next step in developing wealth estimates in this area. Selected comments are made at the end of this section.

Each year the Section of Valuation prepares for each carrier the elements of value of property owned or used in common carrier service. Elements of value include (1) cost of reproduction (except land and rights) new; (2) less depreciation; (3) original cost (except land and rights); (4) present value of land; and (5) original cost of rights-of-way. After consideration of these values and other facts, the Interstate Commerce Commission finds a final value of properties for ratemaking purposes. The methods used in determining these elements of value are described in *Ajax Pipe Line Corporation* (50 Val. Rep. 1). This report is the main source for the following summary.

Pipeline companies prepared a physical inventory of their properties as of December 31, 1947. Units and quantities were grouped by primary accounts within valuation sections, the latter being geographic divisions within a State. These quantities were multiplied by "normal" unit prices for 1947.

The normal unit prices for 1947 used to value the original inventory were not the prices prevailing during that year. Rather, they

were averages of prices obtained during a 5- to 10-year period ending in 1947. Average prices were used to compensate for " \* \* \* the usual transitory nature of inflated prices occurring because of \* \* \* shortages during the war or postwar period." (50 Val. Rep. 30.)

The original inventory is adjusted each year for additions and retirements reported by the carriers. Units added, for example, are multiplied by the appropriate 1947 normal price and the product is added to the inventory. Following this step, each asset class, valued now in the 1947 "normal" prices, is multiplied by a period index appropriate to the class, producing an estimate of cost of reproduction new in current dollars.

The period indexes for a given year are based on averages of annual indexes for the 3 most recent years, an estimate of the current year's price level, and a forecast of the price level in the succeeding year. The annual indexes are prepared from construction cost information received from the carriers, and data provided by the Oil Pipeline Advisory Committee on Valuation, trade publications, and manufacturers and suppliers.

As already noted, the Section prepares estimates of cost of reproduction new, less depreciation. The amount to be allowed for depreciation is based on the age of the asset and estimated remaining future service life. Service lives are estimated by reference to past experience. Past experience reflects both physical and functional depreciation. The former includes deterioration due to "wear, tear, rot, rust, decay, and the action of the elements." The latter "results chiefly from obsolescence, inadequacy, inefficiency, supersession, depletion, and the decline and exhaustion of the traffic which the property was designed to transport." (50 Val. Rep. 28.)

As already noted, the Section makes a yearly estimate of the present value of each carrier's land. In preparing the 1947 inventory of pipeline properties, substantially all land was the subject of a field appraisal to determine market values. The amount of field appraisal work performed by the Section since the late 1940's has declined. Due to lack of personnel, the Section currently performs no field appraisals.

In preparing estimates of current market values, the Section adjusts the 1947 (or later) appraised value using a variety of data, e.g., Census Bureau information on changes in land values.

#### *Concluding comments*

The period indexes used to adjust the inventory valued in 1947 normal prices produce data reflecting a 5-year average price. Wealth estimates for a particular year should be based on price data specific to that year. However, as noted above, the Section does prepare annual indexes

Techniques used in the construction of the 34 annual primary account indexes require review to determine their suitability for purposes of preparing wealth estimates. A similar review should be made of the methods used to estimate present land values.

The Section does not attempt to revalue these balance sheet items: "Operating oil supply," "Materials and supplies," and "Miscellaneous physical property."

## IX. TRANSPORTATION SERVICES

*Group 47*

Freight forwarding-----	(4712)
Arrangement of transportation-----	(4721)
Stockyards-----	(4731)
Rental of railroad cars with care of lading-----	(4742)
Rental of railroad cars without care of lading-----	(4743)
Inspection and weighing services connected with transportation-----	(4782)
Packing and crating-----	(4783)
Fixed facilities for handling motor vehicle transportation, not elsewhere classified-----	(4784)
Services incidental to transportation, not elsewhere classified-----	(4789)

## FREIGHT FORWARDERS

All forwarders are licensed by at least one of three Federal regulatory agencies. Forwarders using railroad, motor carrier, or domestic water transportation facilities report to the Interstate Commerce Commission. Domestic and international airfreight forwarders by water are regulated by the Federal Maritime Commission. At present, the latter do not submit periodic reports to FMC, although these may be required in the future. In any event, we recommend that required data from ocean forwarders be collected by FMC.

Air forwarders report financial data semiannually on CAB form 244. Schedule B provides these balance sheet accounts relating to tangible assets:

- Materials and supplies.
- Automotive equipment.
- Terminal equipment.
- Other property (net).

More detailed information on the latter three accounts should be collected to provide a basis for the distribution of assets among the classes recommended in chapter II.

The profit and loss statement (schedule P) provides no information on rental payments or receipts. Such data, distributed by major asset types, should be collected.

No information is collected on the number and types of owned automotive equipment. We recommend the collection of these data.

Forwarders under the jurisdiction of the ICC and with annual revenues of less than \$100,000 report on form F-b. No data on tangible assets are reported. We recommend the collection of required data by the ICC.

Form F-a is submitted annually by forwarders with revenues of \$100,000 or more. The following balance sheet accounts are used for tangible assets:

- Materials and supplies (108).
- Transportation property (140).
- Nontransportation property (160).

Investment in transportation property is supported by schedule 17 which contains these property accounts.

- Furniture and office equipment.
- Motor and other highway vehicles.
- Land and public improvements.
- Terminal and platform equipment.
- Other property account charges.

To distribute the investment in transportation property among the asset classes set out under data objectives, balances in "Other property account charges" should be distributed among the recommended asset classes. Schedule 29 provides value (and physical) detail for the balance in "Motor and other highway vehicles." Available data include the value (and number) of vehicles, classified by make and kind.

Nontransportation property is supported by schedule 18 which identifies each property and shows its book cost.

Rental payments and receipts in connection with forwarder operations are shown separately in schedules 25 and 26 which support the income statement. Rentals related to nontransportation property are not shown separately. We require information on the amounts of these rentals, the book value of the assets rented out, and the type of asset rented to or from other firms.

#### RENTAL OF RAILROAD CARS

Business units renting railroad cars to or on behalf of any railroad are subject to the jurisdiction of the ICC. Refrigerator car lines owned or controlled by railroad companies file annual report form B-1. Car lines owning 10 or more cars—other than the companies above mentioned—file annual report form B-2.

Physical assets of the railroad-owned or -controlled companies are recorded in these balance sheet accounts:

Material and supplies (712).

Cars or protective service property (731).

Miscellaneous physical property (737).

Schedule 211 supports "Cars or protective service property" and provides this detail:

Land.

Public improvements.

Rolling stock.

Miscellaneous equipment.

Tracks.

Carshop buildings and machinery.

Work equipment.

Ice manufacturing plants.

Natural ice plants.

Ice storage plants.

Precooling plants.

Icing platforms.

Transmission systems.

Testing apparatus.

Miscellaneous structures.

Mechanical protective service units.

Mechanical protective service facilities.

Organization expenses.

It is necessary to separate the book cost of structures and equipment, combined in many accounts, and to distinguish between motor vehicles and other equipment.

Schedule 214 partially supports the "Miscellaneous physical property" account. Only those properties operated by the respondent are

recorded in this schedule. Each operating property is identified and its book cost shown. Net income from nonoperating (leased) "Miscellaneous physical properties" is recorded in income account 511.

Rents payable in connection with the primary activities of these carlines are recorded in a number of accounts. Schedule 321, "Operating expense," contains six rent accounts, each relating to a particular service, e.g., "icing platform service," "heater service," etc. Rents payable for cars are recorded in income account 533 and supported by schedule 383, which identifies the property of each lessor and shows the accrued rent. Information on the kind and number of units of rolling stock leased from others is shown in schedule 418. Rental payments which cannot be thrown into one of the foregoing accounts are recorded in account 543 "Miscellaneous rents."

The major activity of these carlines is the rental of rolling stock to railroads. Receipts from car rentals are shown in schedule 310 "Operating revenues." These cars typically are rented by the railroads on an "as needed" basis, payment for them being a per diem and/or mileage charge; it follows that at a particular point in time only a part of the refrigerator fleet may be in railroad service. It is necessary to determine the average number of rental cars in railroad service during the year in order that these assets can be allocated to the railroads on a use basis. Besides equipment rented by the railroads on a day-to-day basis, a number of cars are on term leases. The number leased at the close of the year is shown in schedule 419.

Rental receipts for the use of protective service properties other than cars are recorded in account 510 "Miscellaneous rent income."

Schedule 417 distributes owned rolling stock between refrigerator cars and various types of other cars.

Form B-2 is not required from business units owning less than 10 cars. We recommend the collection of required data from firms in this size-class providing they are primarily engaged in renting cars. The identity of all private-car owners can be learned from the "Railway Equipment Register."

These firms plus those reporting to the ICC on form B-2 sum to a total greater than the number belonging to the industry. This occurs because a carline as defined in the Interstate Commerce Act includes any business unit that tenders a private car to a railroad for movement from one station to another. Many of the firms reporting to ICC use their cars primarily or exclusively for the movement of their own products. These assets should be treated as owned by the appropriate other economic sectors. The remaining reporting units consist of firms or departments falling within the industry, i.e., economic units primarily engaged in renting railroad cars.

For purposes of developing a wealth statement based on industry of use, it will be necessary to determine the average number of cars rented to railroads by carlines and by businesses in other economic sectors.

Form B-2 contains no general balance sheet. The only investment data collected cover the end-of-year gross book values of cars, by type of car. The number of cars, by type, also is shown. We recommend collection of data on other tangible assets by the classes recommended in chapter II.

The total number of cars leased (as contrasted with short-term rentals) to and from others at close of year is shown by type of car and by two classes of lessees/lessors, viz, railroad and express companies or "all others."

#### ARRANGEMENT OF TRANSPORTATION

This industry includes travel agents, transportation brokers, customhouse brokers, transportation rate bureaus, operators of conducted tours, and others furnishing information about transportation and/or acting as agents in arranging transportation. With exceptions to be noted, Federal agencies neither license nor receive reports from business units within this industry.

The Bureau of Customs licenses all customhouse brokers, but it does not require periodic reports from them.

Rate organizations operating under agreements between carriers and freight forwarders subject to the Interstate Commerce Act report to the ICC annually on form RBO. The balance sheet does not show separately investment in tangible assets. Rental payments are shown but the asset rented is not identified.

The Federal Maritime Commission passes on agreements submitted by steamship conferences but does not require a periodic financial report.

Brokers of motor vehicle transportation subject to the Interstate Commerce Act are licensed by the ICC. No periodic reports are required by that agency. Neither FMC nor CAB regulates brokers.

We recommend the collection of necessary data from the business units within this industry. Data from the classes of firms discussed above might be collected by the regulatory agency. Alternatively, data from these as well as the many classes of business not subject to Federal regulation could be collected by the Census Bureau.

#### STOCKYARDS

Operators of yards handling livestock in interstate commerce report annually to the Department of Agriculture (Packers and Stockyards Division, AMS). Operators of yards who buy and sell livestock file form PS-130. Operators who do not buy and sell—providing facilities only—file form PS-129. (We note here a reporting overlap between some of those companies and some railroad terminal companies engaged in stockyard operation.) The universe of companies reporting to the Agriculture Department excludes operators in intrastate commerce. These are believed to be relatively unimportant.

Form PS-129 provides the following balance sheet accounts for tangible assets:

- Inventories.
- Livestock.
- Feed.
- Material.
- Land.
- Building and structures.
- Equipment.

Feed inventories, by type, are detailed on pages 11-12 of the form. The book values (and acres) of land owned and used for stockyard purposes, used for other than stockyard purposes, and land not in use are given on page 7. Buildings and structures are identified on page 8 along with the associated book values. On the same page the following equipment detail is shown:

- Furniture and fixtures.
- Tools and movables.
- Yard equipment.
- Horses.
- Wagons.
- Other.

Rental receipts classified by type of asset rented are shown on page 13. Leasehold payments and a total for other rents are given on page 14.

Form PS-130 is similar although less detailed than form PS-129.

#### OTHER TRANSPORTATION SERVICES

We know of no data currently being collected by Federal agencies from the four remaining industries within the major group. Once business units belonging to the industries are identified (probably from the list of employers under the social security program), required data should be collected by the Census Bureau if asset data on the transportation industries are to be complete.

#### ANNEX A

##### THE VALUATION PROBLEM WITH RESPECT TO TRANSPORTATION ENTERPRISES

(By Ernest W. Williams, Jr.)

It seems clear that an attempt to compile aggregates of the "wealth" devoted to the transport function will present difficulties, perhaps of a major order. It would seem desirable that data compiled in current dollars for transport plant and equipment be capable of addition to data for other industries, as well as capable of comparison with aggregates for those industries without an undue distortion. Similarly the valuation placed upon the rail system ought to be capable of comparison in a meaningful sense with that placed upon every other form of transport.

The market system, although with a number of imperfections, places values upon the largest part of assets which change hands with some frequency, whether for the same or for other uses to which they may be adapted. It reflects in price current demand and supply conditions as well as appraisals of future usefulness or earning power of these assets. Much transportation equipment as well as many items common to the transport and other industries have a market value. Such items are not, however, always segregated in the accounts from other items which the market has no occasion to appraise directly. Where items are currently in production, the price of new equipment bears some relationship to the cost of production as well as a relationship to old and used equipment.

Current market value presumably affords the best measure for purposes of wealth computations because it tends to reflect all the conditions which affect the usefulness of assets under the conditions and expectations at the time of valuation. Such values can, of course, be affected by cyclical phenomena as well as by technological change and other factors over a period of time. Hence, values found for particular assets at a given time may grow or decline out of proportion to changes in the physical condition of the assets. Extrapolation of values is, therefore, dangerous, but wherever available, market value ought to be employed as the preferred measure of present wealth.

Unfortunately pipelines, railroads, and some other types of transport are not customarily sold as going concerns, nor are there regular market trans-



actions in most of the basic facilities employed in transport, whether publicly or privately owned. Moreover, the current value of fixed transport plant is heavily affected by (1) location of the works or structures; (2) degree of the utilization of total transport capacity in the area served and the prospects thereof; and (3) degree of utilization of a particular type of transport plant in relation to competitive forms and the prospects of improvement or decline. Locational as well as technological obsolescence is embraced in portions of the transport plant. The former is almost never recognized in recorded depreciation; the latter only partly so. In these and other circumstances replacement cost, less depreciation, may depart widely from any figure that would be assigned for value in use. It is questionable whether, for some portions of the rail and highway plants, terminal facilities of all kinds, and certain navigation works, it would afford a basis most nearly comparable to a current market value if such a value existed.

To value certain navigation works, for example, at replacement cost would impart an inflated element. Channels or works which have never developed substantial traffic may have a value less than their original cost, despite the relatively permanent character of some such works, simply because they were built in contemplation of a traffic which never developed, either because of initial miscalculation or failure to apply economic tests or because of changes in circumstances affecting the flow of traffic.

In the case of such a navigation work, neither a market value nor a capitalization of earning power can be ascertained in any direct way. It may be that a net revenue could be estimated for the value of traffic being carried and reasonably to be expected and a value computed therefrom. Such a method would, however, be impossible to apply to many elements of transport plant. It seems clear that no single standard can be applied throughout and that, depending upon the resources available for the task, judgment will need to be applied to the various segregable elements of plant in order to arrive at the best approximation of market value in the hypothetical event that the sale of the assets for continued service in transport were contemplated. Thus, under circumstances where growth has been occurring and is in prospect and where capacity is reasonably well utilized, replacement cost, less depreciation, would appear to be a reasonable approximation. Care should be taken, however, to review depreciation policies reflected in the reserves since, for particular classes of plant, they may well fail adequately to reflect technological obsolescence. In instances of declining trend of business which may be expected to continue, and of less than optimum utilization of capacity, it would appear that when some assets reach the end of their physical lives they will not be replaced. Indeed, plant ought to be undergoing continual shrinkage in such instances.

Portions, at least, of the rail industry fall in this category and the use of replacement cost as a measure of value would appear peculiarly inappropriate. Yet the absence of earning power for a rail carrier taken as a whole does not indicate the absence of "wealth" embodied in portions of its plant and equipment. Unprofitable systems will have profitable segments. Systems will embrace some lines which can easily be dispensed with and others which remain of substantial importance to the transport network. The use of the earning power of the railroads as a whole, or of regional groups, or of individual carriers, would result in a value seriously short of the mark. In effect, deficit segments would be given a negative value which would offset a portion of the value found for segments which contribute materially to the performance of the transport function. Although the continued operation of underutilized and obsolescent facilities may well constitute a drag upon the economy, it is difficult to accept a negative value for the facility in use when it ordinarily has a positive value as scrap. It would appear to be impossible to classify rail permanent way and structures in a way to admit of application of scrap values in some instances and of value reflecting earning power in others. This results not only from the magnitude of the task but also from the fact that much required information is not available. The value of the railroad plant on the basis of capitalization of recent earnings at 10 percent is perhaps of the order of 2 percent of the book values shown by the carriers. Replacement cost less depreciation would presumably exceed book value by a considerable margin. I do not at present see a basis for evaluation of this industry which is compatible with my understanding of the general objective.

In respect of the highway plant, expenditures at all levels of government are available. However, portions of the highway network are overdeveloped while other portions are inadequate in capacity, design standards, physical condition, or all three. Past expenditures give an insufficient guide to the present value. However, substantial portions, especially of the rural road system, have been constructed or improved in response to political pressures rather than to economic need commensurate with the cost of the facility. The increasing dominance of Federal and State expenditures has moderated but not eliminated this condition.

It would appear that replacement cost should be a quite reasonable method for application to pipelines, to the bulk of the highway system, and to most elements of transport equipment, where present market value of the asset is not available. Portions of the highway system, of waterway improvements, and of the rail industry seem to present the possibility of overvaluation by this method.

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ANNEX B

RAILROAD FORM A: INVENTORY OF EQUIPMENT

(from Schedule 417)

LOCOMOTIVES

Steam—Freight.  
 Steam—Passenger.  
 Steam—Freight or passenger.  
 Steam—Switching.  
 Electric—Freight.  
 Electric—Passenger.  
 Electric—Freight or passenger.  
 Electric—Switching.  
 Diesel—Freight: A units.  
 Diesel—Freight: B units.  
 Diesel—Passenger: A units.  
 Diesel—Passenger: B units.  
 Diesel—Multiple purpose: A units.  
 Diesel—Multiple purpose: B units.  
 Diesel—Switching: A units.  
 Diesel—Switching: B units.

OTHER

Freight train cars:  
 Boxcars—General service.  
 Boxcars—Special service.  
 Flatcars.  
 Stock cars.  
 Gondola cars.  
 Hopper cars—Open top.  
 Hopper cars—Covered.  
 Refrigerated cars.  
 Rack cars.  
 Tank cars.  
 Other freight train cars.  
 Caboose cars.  
 Passenger train cars (non-self-propelled):  
 Coaches.  
 Combination coach cars.  
 Parlor cars.  
 Sleeping cars.  
 Club, lounge and observation cars.  
 Other passenger carrying cars.  
 Postal cars.  
 Combination mail and baggage, or mail and express cars.  
 Baggage, express, and other non-passenger-carrying cars.

## Passenger train cars (self-propelled) :

- Coaches.
- Combination coach cars.
- Other self-propelled.

## Company service equipment :

- Business cars.
- Ballast and dump cars.
- Derrick cars.
- Boarding outfit cars.
- Wrecking cars (regularly assigned).
- Snow removing cars.
- Other company service equipment cars.

## Floating equipment (self-propelled vessels) :

- Tugboats.
- Car ferries and other self-propelled vessels.

## Floating equipment (non-self-propelled vessels) :

- Car floats.
- Lighters, barges and other non-self-propelled vessels.

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APPENDIX II: PART M  
REPORT OF THE WORKING GROUP ON COMMUNICA-  
TIONS AND PUBLIC UTILITIES WEALTH

Prepared by DAVID J. HYAMS

MEMBERSHIP OF THE COMMUNICATIONS AND PUBLIC UTILITIES  
WORKING GROUP

- Joseph R. Rose (chairman), Wharton School of Finance & Commerce, University of Pennsylvania.
- Eli W. Clemens, College of Business & Public Administration, University of Maryland.
- James B. Corey, consultant.
- Theodore I. Gradin, Bureau of Statistics, American Gas Association. (Mr. Gradin was represented at one meeting by Miss Zoe Baylies.)
- Lyford N. Greene, American Telephone & Telegraph Co.
- David J. Hyams (secretary), Wealth Inventory Planning Study, The George Washington University.
- Robert E. Johnson, Finance Division, Western Electric Company.
- David A. Kosh, David A. Kosh Associates, Inc. (Mr. Kosh was represented at two meetings by Mr. Gerald Glassman.)
- Charles H. Kressler, Valuation Division, Gannett Fleming Corddry & Carpenter, Inc. (Mr. Kressler was represented at one meeting by Mr. W. C. Fitch.)
- Arthur L. Lanigan, Chesapeake & Potomac Telephone Cos. (Mr. Lanigan was represented at two meetings by Mr. O. O. Ashworth.)
- E. W. Morehouse, consultant in public utility economics.
- Israel Putnam, Office of Economics, Federal Power Commission.
- Herbert F. Reem, Office of Economics, Federal Power Commission.
- Arthur Schatzow, Broadcast Bureau, Federal Communications Commission.
- Robert E. Stromberg, Common Carrier Bureau, Federal Communications Commission.

## PREFACE

The Working Group on Communications and Public Utilities Wealth held three daylong meetings to discuss the topics covered in this report. The writer of this report, who served as group secretary, takes this opportunity to thank members for their participation and to acknowledge their very large contribution to the final shape of the report.

The wording of the report is the responsibility of the secretary. Whereas he has attempted to reflect the consensus of the group, no member should be held responsible for all the views expressed. Individual members have been free to write supplementary statements clarifying their individual views if they so desired.

DAVID J. HYAMS.

## COMMUNICATIONS AND PUBLIC UTILITIES

### I. DATA OBJECTIVES

The first chapter of this report is devoted to working group recommendations concerning the kinds of information that should be presented on the wealth of the public utility industries. In the remaining two chapters, we review current sources of data in the light of data requirements and identify needs for additional data.

#### THE UTILITY SECTOR AND FUNCTION

In keeping with the group's area of primary responsibility, the data review covers the communications, electric, gas, and sanitary services industries described in the "Standard Industrial Classification Manual," (SIC).<sup>1</sup>

By definition, only investor- and cooperatively owned business units are included in these industries. However, since much utility wealth is governmentally owned, we recommend that utility-enterprise assets be distinguished from other wealth in the Federal, and State and local sectors, and that they be classified in a manner consistent with our recommendations for privately owned properties.

In addition to the assets devoted to the performance of utility services for the general public by these private and Government enterprises, similar assets are owned by some nonutility companies. These assets provide utility-type services to their owners. We recommend that the gross and net reproduction costs of communications, electric generating, water impounding and processing, and sewage treatment facilities owned by nonutilities be distinguished from their other assets in presentations of wealth data. The usefulness of the data would not be impaired significantly if reporting cutoffs were established in the interests of collecting better data and minimizing collection costs.

The communications assets of nonutilities include those facilities used for the transmission of oral or written information between two or more identifiable points. Generally included within this definition are microwave, cable, and wire channel equipment, and radio and television broadcast equipment other than that owned by business units within the broadcast industries described in the SIC. In those transportation and utility industries subject to regulation by a Federal or State agency, separate accounts are usually required for communications equipment.

Our interest in electric generating facilities centers on industrial installations which are operated on a full-time basis. Standby facilities or those used in small operations, such as rural household or

<sup>1</sup>Bureau of the Budget, "Standard Industrial Classification Manual," 1957.

irrigation generation, can be ignored. Efforts at collecting data on water processing and sewage treatment facilities should focus on significant industrial installations.

#### USES OF WEALTH DATA

The group's discussion of uses of wealth data did not go beyond the staff paper on this subject. Since an expanded version of the paper appears in the staff report, uses will not be discussed here. It is clear, however, that because of the high capital intensity of utilities, good wealth estimates in this area are particularly important. Likewise, changes in output-capital ratios have significance in analyzing changes in productive efficiency.

We now turn to a discussion of the ways in which utility wealth should be measured and classified. In shaping these recommendations, we have been mindful of the need for data comparability among economic sectors as well as the special requirements of users of data on public utilities.

#### INDUSTRIAL DETAIL OF WEALTH ESTIMATES

The "Standard Industrial Classification Manual" recognizes 19 minor (4-digit) industries engaged in the provision of communications, electric, gas, water, and sanitary and related services to the public. The SIC treats the company as the primary economic unit of most of these industries. This contrasts with the "establishment" concept obtaining in manufacturing and some other sectors.<sup>2</sup> Data from industries of companies are not usually comparable with data from industries of establishments since the former often reflect greater diversification of economic activity than do the latter. The exclusive use of company data is unsatisfactory since such data inevitably introduce distortions in measures based on activity.

In order to overcome the problem, it is necessary that those company assets that are related to secondary utility and nonutility activities be separated from primary activity assets and be counted with the wealth of the appropriate "other" industry or industries.

This recommendation immediately raises a problem with respect to three of the utility industries since they are defined as industries performing both primary and secondary activities. These industries are composed of these combination companies:

Electric and other services combined.....	(4931)
Gas and other services combined.....	(4932)
Combination companies and systems, not elsewhere classified.....	(4939)

We recommend that the utility assets of combination companies be distributed among the other utility industries. The nonutility assets of combination companies, of course, would be distributed among the appropriate industries. Under utility accounting procedure, such assets are separated in the books of account.

<sup>2</sup> An establishment is defined as an economic unit usually at one location and engaged in one, or predominately one, activity.



Abolition of the combination industries leaves 16 minor industries for us to consider. Data about them should be consolidated to form the following 11 industrial groupings:

(1) Telephone communication (wire or radio).....	(4811)
(2) Telegraph communication (wire or radio).....	(4821)
(3) Radio broadcasting.....	(4832)
Television broadcasting.....	(4833)
Communication services, not elsewhere classified.....	(4899)
(4) Electric systems.....	(4911)
(5) Natural gas transmission.....	(4922)
(6) Natural gas transmission and distribution.....	(4923)
(7) Natural gas distribution.....	(4924)
Mixed, manufactured, or L.P. gas production and/or distribution..	(4925)
(8) Water supply.....	(4941)
(9) Sewage systems.....	(4952)
(10) Steam supply.....	(4961)
(11) Refuse systems.....	(4953)
Sanitary services, not elsewhere classified.....	(4959)
Irrigation system operation.....	(4971)

All tangible assets of the straight gas companies as well as the gas-related assets of combination companies should be assigned to one of the above three gas industries on the basis of a classification of the gas operation as an entity. We do not intend, for example, that the incidental transmission facilities of a distribution company be assigned to the transmission industry or the existence of incidental transmission facilities be used as the basis for converting a distribution company (or department) into a transmission and distribution company (or department).

The existing common plant of combination companies is relatively minor. Yet it raises the familiar allocation problem. We suggest that these assets be aggregated at the level of the SIC major group, i.e., "Electric, Gas, and Sanitary Services." This recommendation is consistent with the proposed treatment of the central office assets of multi-industry manufacturing companies.

We note that some plant allocated to one or another of the departments by the combination company is jointly used. For example, the steam department assets of a combination company also producing electricity would be represented by the steam distribution facilities while the steam production facilities would be carried as part of the electric department. We doubt that the distortions introduced under these circumstances are significant.

#### VALUATION OF TANGIBLE ASSETS

Historical costs are inadequate measures of tangible wealth since they reflect purchases made at various price levels over time.<sup>3</sup> We recommend that tangible wealth be measured in the dollars of a single year rather than in the dollars of the years in which purchased.

Gross book values in the various asset accounts will have to be adjusted for price changes through the use of price indexes appropriate

<sup>3</sup> In connection with the recording of costs, we call attention to an important characteristic of utility accounting. Plant is recorded at original cost, which is the cost to the person first devoting a property to public service. When an operating property is sold at a price higher than original cost, the buyer throws the difference into an acquisition adjustment account. The original cost is spread among the primary plant accounts. The maintenance of plant accounts at original cost eliminates one problem that turns up when applying price indexes to "aged" book values.

to the account. The price indexes should not reflect changes in the quality of the asset (i.e., model or specification changes). However, indexes should reflect those price movements resulting from changes in input (labor and material) prices and in the efficiency with which inputs are combined to produce the asset (productivity). The proposed indexes differ conceptually from indexes sometimes used in arriving at a "trended original cost" since the latter indexes assume no changes in construction methods. Thus, changes in productivity reflected in an estimate of trended original cost are limited to those embedded in the prices of purchased materials.

Beside a gross measure of tangible wealth, we recommend a net measure that will reflect the loss of economic life through physical wear and obsolescence. Past experience is the only practical basis for computing depreciated values, since market values, representing the alternative basis, exist for only a relatively few classes of assets. Aside from feasibility, depreciated values have the virtue of reflecting production costs, rather than the state of expectations. This assures that a physically immobile asset at one location is given the same value as an identical asset in another location.

On the other hand, depreciated values calculated on the basis of past experience can, under less than competitive conditions, depart from real (or theoretical) market value. Past experience will not reflect a change in prospective earnings, or a current acceleration in the rate of technological improvement, or even past rates of technological obsolescence in situations where management has been reluctant to replace items before they are fully depreciated for book purposes.

We visualize the following steps in the preparation of the gross and net estimates of wealth. (1) Global gross book values are collected at the level of the primary account and by State of location from business units in each industry. As will be noted later, much of this information already is being filed by companies in the communications and utility industries. (2) On a sample basis, information is collected about the age-composition of these book values. (3) With these two sets of data and appropriate price indexes, it is possible to make current-dollar estimates of gross wealth. (4) Finally, the gross measures are adjusted for depreciation based on information about service lives.<sup>4</sup>

We recommend that along with the above gross and net wealth estimates, there also be presented comparable aggregates of original cost data. We make this recommendation because of the utility analyst's special interest in these data, an interest stemming from their use in the ratemaking process.

#### *Ratemaking value*

It is well known that as part of the procedure for pricing utility output regulatory agencies "find" a value for utility properties. Taken together with an allowed rate of return, this ratemaking value or rate-base produces (or is expected to produce) a particular level of

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<sup>4</sup>In this regard the use of average service lives in estimating depreciation, without appropriate recognition of dispersion of retirements, will bias the values downward.

earnings. The sum of these rate bases will differ from wealth estimates reflecting production costs adjusted for price changes since most States establish ratemaking values which approximate depreciated original cost. (In a fair value jurisdiction, the rate base will approximate undepreciated original cost.)

Our recommendations for the valuation of utility wealth are patterned after the current value criteria used by other working groups for the valuation of wealth in their economic sectors. We have not attempted to follow regulatory agency valuation practices. We wish to stress that our recommendations have not been made with a view to the use of wealth estimates in ratemaking proceedings.

(Messrs. Kosh and Glassman have prepared a supplemental statement on valuation which appears as annex A of this report.)

#### DESCRIPTION OF THE HANDY-WHITMAN AND BELL SYSTEM INDEXES

In connection with the adjustment of book values for price change, we call attention to the Handy-Whitman and Bell System cost indexes. They are briefly described in the following paragraphs. We have not attempted to evaluate them for wealth estimation purposes. We recommend a review of their adequacy for this purpose.

Construction cost indexes are prepared semiannually for electric, gas and water utilities by Whitman, Requardt, and Associates of Baltimore, Md.<sup>5</sup>

Indexes are prepared for each of six geographic divisions within the United States: North Atlantic, South Atlantic, north central, south central, plateau, and Pacific coast.

Annual cost index numbers for water utilities are available from 1912 to 1936; thereafter semiannual figures were prepared. The electric and gas utility series begin in 1911, and annual index numbers are available from 1911 until 1919 and for the year 1923. Semiannual figures were prepared in 1920 and 1921 and from 1924 to the present. A series of indexes also are prepared for reinforced concrete and brick construction. The series begins with 1915; consecutive semiannual figures are available from 1924 to the present.

Two types of indexes are available for each of the three utilities. The first type is specific to particular primary plant accounts recognized by the National Association of Railroad and Utility Commissioners (NARUC) in the case of water utilities, and by the Federal Power Commission, for gas and electric utilities. The second type of index shows price trends for various classes of equipment and labor. These two types of indexes are illustrated by the following listing of

<sup>5</sup>The paragraphs which follow have been prepared from material found in these publications:

Ernest C. North, "Trended Costs by General Indexes," Proceedings of the Second Annual Iowa State Conference on Public Utility Valuation and the Ratemaking Process. Ames, Iowa, 1963.

Ezra B. Whitman and Ernest C. North, "Trending Public Utility Construction Cost Indexes," Public Utilities Fortnightly, III, No. 5 (Aug. 27, 1963).

Whitman, Requardt and Associates, "The Handy-Whitman Index of Public Utility Construction Costs." Bull. No. 75, Baltimore, 1962.

—, "The Handy-Whitman Index of Water Utility Construction Costs." Bull. No. 11, Baltimore, 1962.

indexes relating to gas plant construction (indexes specific to a particular primary account are identifiable by the account number) :

- Total construction and equipment (manufactured gas).
- Mechanical equipment, exclusive of gas holders.
- Gas holders, excluding foundation (362).
- Total transmission plant.
- Structures and improvements (366).
- Mains (367).
- Compressor station equipment (368).
- Mains, cast iron (376).
- Mains, steel (376).
- Services (380).
- Meters (381).
- Meter installations (382).
- House regulators (383).
- House regulator installations (384).
- Cast iron pipe, 6 inches and over.
- Cast iron fittings, sizes 4 to 24 inches.
- Steel pipe, size 16 inches.
- Steel pipe, size 2 inches.
- Compressors.
- Pig lead.
- Lumber, rough yellow pine, size 3 by 12 inches.
- Common labor.
- Gas labor.

Indexes are not available for each of the primary plant accounts. Ten primary account indexes are available for water and for gas utilities. Twenty-three primary account indexes are published for electric utilities. It appears, however, that most depreciable assets (based on dollar amounts recorded in the primary accounts) are covered by indexes.

According to the compiler, the indexes are widely used for trending original cost data to estimate reproduction cost at price levels of a particular year. With regard to the construction of the indexes, the compiler states :

Prices of basic materials such as cement, sand, stone, cast iron pipe, wire, etc., are obtained from standard publications such as "Engineering News-Record" and "Iron Age" and checked against prices actually being paid for such materials wherever possible. Labor cost trends are computed from labor rates obtained from sources such as the U.S. Department of Labor, labor unions, and the Builders Association of Chicago. Mechanical and electrical equipment prices and trends are obtained from nationally known manufacturers \* \* \*.

The proportions and the weight of the basic materials, labor, and equipment used in any composite index of various classes of utility property have been based on the analyses of many millions of dollars worth of plant and construction. During recent years it has been possible to make, through valuation proceedings and other sources, various studies and analyses of utility property accounts giving labor and material components so that comparisons could be made with the "Handy-Whitman Index." As part of the studies made for the purpose of improving Bulletin No. 53 certain utility companies furnished analyses of property accounts which permitted additional comparisons. The review of the weighing of the labor and the various material components disclosed that the original work was carefully done and that there was little reason to change published cost trends. Although minor changes to the weightings might be indicated in certain cases it was realized that any change in weight would have little effect on the index numbers and that it would be extremely desirable to retain the existing trend intact if at all possible.

We recommend review of the adequacy for wealth purposes of the Handy-Whitman indexes. Such a review would determine the significance for wealth purposes of retention of "the existing trend." Further, it would determine to what extent allowance has been made in the indexes for changes in the efficiency (productivity) with which utility installations are made.

The compiler has stated that the present cost of new equipment may be less than the trended cost of old equipment of equal capacity. This suggests that adequate allowances may not have been made for model changes since when these are associated with cost increases, the index should produce a trended value lower than that of the unadjusted prices of new equipment. (See ch. 6 of the staff report for a discussion of price adjustments.)

The American Telephone & Telegraph Co. constructs annual cost indexes of telephone plant. The indexes are based on Bell System experience. Their applicability to non-Bell investment is doubtful, since the major Bell supplier does not serve the rest of the industry, and the supplier's prices may not move with equipment prices in the rest of the industry. While reliance on Bell indexes might not affect national estimates (Bell investment accounts for 85 per cent of the industry), use of the indexes may not be appropriate in those few States where Bell is not the major carrier.<sup>6</sup>

Bell indexes go back to 1945 and are available for 20 categories of equipment and structures. These categories are consistent with the primary plant accounts prescribed by FPC.

The categories are:

Buildings.

Central office equipment:<sup>7</sup>

Manual.

Panel.

Step by step.

Crossbar.

Circuit.

Radio.

Station apparatus:<sup>7</sup>

Teletypewriter.

Telephone and miscellaneous.

Station connections.

Large private branch exchanges.

Pole lines.

Aerial cable.

Underground cable.

Buried cable.

Submarine cable.

Aerial wire.

Underground conduit.

Furniture and office equipment.

Vehicles and other work equipment.

<sup>6</sup> Information on these indexes is contained in the following papers:

Henry E. Crampton, "A Practical Approach to the Development of the Current Cost of Utility Plant," proceedings of the Second Annual Iowa State Conference on Public Utility Valuation and the Rate Making Process, Ames, Iowa, 1963.

Arthur E. Tebbutt, "Price Trending Processes," proceedings of the Iowa State Conference on Public Utility Valuation and the Rate Making Process, Ames, Iowa, 1962.

<sup>7</sup> Indexes are prepared for subdivisions of this primary account.

Changes in the specification of equipment and materials are handled through the linking process followed by the Bureau of Labor Statistics. The Bell indexes refer to equipment and materials in place. They are designed to reflect price movements resulting from changes in input prices and the efficiency with which inputs are combined to produce the assets.

#### ASSET-TYPE DETAIL OF WEALTH ESTIMATES

We recommend that the properties of firms belonging to the utilities industries first be classified by the following broad physical types:

- Land.
- Structures.
- Equipment.
- Transportation.
- Materials, supplies, inventories.
- Stored, pumped water.<sup>8</sup>

In line with an earlier recommendation, it will probably be necessary to spread balances in the foregoing items among additional categories. Gas transmission companies own communications equipment, and we have asked for a separation of that class of property when owned by noncommunications firms. Similarly, assets used in generating electricity and in connection with water and sewage treatment are to be distinguished from other properties.

In addition to the classification of assets by physical type, we recommend that electric, gas, and waterplant in service be distributed alternatively by function. These functional groupings are consistent generally with present regulatory reporting practices:

Electric plant categories include:

- Production plant:
  - Steam.
  - Nuclear.
  - Hydraulic.
  - Pump storage.<sup>9</sup>
- Other:
  - Gas turbine.<sup>9</sup>

- Transmission plant.
- Distribution plant.
- General plant.

Gas plant categories include:

- Manufactured gas production plant.
- Storage plant.
- Transmission plant.
- Distribution plant.
- General plant.

While regulatory reporting procedure includes natural gas production properties and related structures and equipment within plant in service, they should not be included as wealth of the gas industry. Rather, they are to be treated as nonutility assets and recorded as part of the mining sector, a classification consistent with the SIC.

<sup>8</sup> The Federal Power Commission soon may prescribe an account which will reflect the pumping cost of stored water.

<sup>9</sup> These items presently are not separated within the indicated two types of production plant.

Recommended functional categories for the tangibles of water utilities include:

- Source of supply plant.
- Pumping plant.
- Water treatment plant.
- Transmission and distribution plant.
- General plant.

#### GEOGRAPHICAL DETAIL OF WEALTH ESTIMATES

We recommend the presentation of wealth estimates on a State-by-State basis. Accordingly, multistate utilities will have to distribute book values by State. This should not impose a major burden, since the pattern of State utility regulation (and State taxation practices) makes it necessary for utilities to separate assets by State of location.

A few assets properly are not allocable to any State. If significant, they can be shown as a separate national aggregate. These would include the high seas and outer space facilities of some communications firms. American-owned assets located in other countries, of course, are reflected in domestic wealth statements as foreign investments.

#### OWNERSHIP AND USE OF WEALTH

We recommend the presentation of wealth estimates on both ownership and use bases.

The basic data for the former set of estimates come from the balance sheets of business units classified within the communications and public utility sector. The second set of estimates is developed by adjusting ownership data for the value of assets rented to and from out-of-sector industries. This requires that all lessors furnished the book costs of leased assets, classified by asset type. Rental receipts classified by asset type also must be reported. Lessees must report rental payments by asset type. These three figures provide a basis for allocating wealth from industry of ownership to industry of use.

The use of telephone and telegraph facilities should be looked upon as the sale of a service rather than the rental of a facility, and thus, no attempt should be made to allocate parts of the plant of the communications sector to sectors "leasing" private lines or networks. Similarly, no allocation should be made of plant from one industry to another within the communications sector, e.g., telephone to telegraph, etc.

It can be argued that this treatment does not reflect fully the assets actually used in the production of the output of a particular industry. For example, facilities leased from the telephone industry represent a significant portion of the assets used by radio and television broadcasters; similarly, more than half of domestic telegraph circuitry is leased from the telephone industry. Yet, in neither case would the assets be reflected in a statement distributing wealth by industry of use.

However, we believe our recommended treatment has the twin merits of conventionality and practicality. Conventionally, we treat as rented properties those which are in the possession of and use of the lessee. Communications facilities, on the other hand, are operated

by the communications firms. The recommendation avoids the practical (and conceptual) problems involved in the separation and allocation of telephone properties which are serving at any moment most or all economic sectors.

#### MEASURES OF PHYSICAL CHARACTERISTICS

We make no recommendation for the collection of new supplementary physical detail about the assets of the communications and public utility industries. However, as needs for specific data become apparent, it is likely that they can be met from currently collected data or furnished with relative ease by firms within the industry. A variety of data relating to the physical characteristics of plant are reported to regulatory agencies and trade associations, including, for example, outside telephone plant mileage, by type and State; numbers of central office exchange circuits, and telephones, by State; miles of gas distribution and transmission line, by diameter of pipe, by State; and, installed and rated capacities, by generating station.

### II. COMMUNICATIONS

These industries are within SIC major group 48:

Telephone communications (wire or radio)-----	(4811)
Telegraph communications (wire or radio)-----	(4821)
Radio broadcasting-----	(4832)
Television broadcasting-----	(4833)
Communication services, not elsewhere classified-----	(4899)

#### TELEPHONE COMMUNICATION

At the end of 1962, there were 2,800 companies providing telephone service in the United States, including Puerto Rico. Their gross investment in plant was estimated at \$33.7 billion. A relatively few companies accounted for the great bulk of this investment. Eighty-five percent was on the books of the 24 companies comprising the Bell group. Another 6 percent was owned by the more than 30 companies making up the General Telephone System.

There are two sources of data on the telephone industry. The most importance of these is the Federal Communications Commission which receives annual reports from interstate common carriers. Companies with annual operating revenues exceeding \$100,000 file form M with the regulatory agency. In 1961, 65 firms completed this report, among them all companies in the Bell group and some of the companies in the General group. In addition to the companies filing required reports, about a dozen large intra-State firms voluntarily submit a form M to the FCC. These voluntary reporters include more of the companies in the General Telephone System. Together, the 75-80 firms reporting to FCC on form M carry on their books almost 94 percent of the industry's assets.

The United States Independent Telephone Association (Washington, D.C.) annually collects data from independent companies. In 1960 over 500 firms filed data with USITA. After adjusting for the overlap in coverage by the two organizations, it is estimated that USITA receives reports from companies owning an additional 4 per-



cent of the industry's assets. In summary, the two data collection organizations provide coverage of companies accounting for 98 per cent of the industry's tangible properties.

Consideration will be given to form M as a source of data for purposes of wealth estimation.

*Value data by asset class*

Seven balance sheet accounts relate to tangible properties:

- (100. 1) Telephone plant in service.
- (100. 2) Telephone plant under construction.
- (100. 3) Property held for future telephone use.
- (100. 4) Telephone plant acquisition adjustment.
- (100. 7) Telephone plant adjustment.
- (103) Miscellaneous physical property.
- (122) Material and supplies.

"Telephone plant in service" is supported by schedule 12A which distributes the balance among the following primary accounts:

- (201) Organization.
- (202) Franchises.
- (203) Patent rights.
- (211) Land.
- (212) Buildings.
- (221) Central office equipment.
- (231) Station apparatus.
- (232) Station connections.
- (234) Large private branch exchanges.
- (241) Pole lines.
- (242.1) Aerial cable.
- (242. 2) Underground cable.
- (242. 3) Buried cable.
- (242. 4) Submarine cable.
- (243) Aerial wire.
- (244) Underground conduit.
- (261) Furniture and office equipment.
- (264) Vehicles and other work equipment.
- (276) Telephone plant acquired.
- (277) Telephone plant sold.

Balances in accounts 201-203 should be ignored since they relate to intangibles. The remaining "plant in service" accounts can be grouped into the recommended asset classes after the collection of some additional data on accounts 264, 276, and 277. Work equipment must be separated from transport vehicles. Bases are needed for the allocation of plant acquired or sold.

Procedures also must be developed for integrating balances in accounts 100.2 and 100.3. The two adjustment accounts should be ignored. The balance-sheet account for "Miscellaneous physical property" is supported by schedule 16. The schedule shows the location and identity of each property with a book cost of \$10,000 or more (in some cases, the lower cutoff is \$2,000). The need for additional data on miscellaneous physical properties will turn on the completeness with which they actually are described in the regulatory report.

*Location of assets*

Form M does not provide a State-by-State distribution of the book costs of tangible assets. However, most companies operate in only one State (even though they legally are interstate carriers). Furthermore, the multistate companies file distributions of tangible assets, by State, as supplements to the form M's filed with State regulatory agencies. Also, in connection with the FCC's responsibility for prescribing depreciation accrual rates, the agency reviews depreciation studies filed by telephone carriers. Data in these studies are organized in a manner which will facilitate the estimation of gross wealth by State of location.

Book cost data in these studies are organized by State, by year of acquisition, and by type of depreciable asset. The depreciation studies spread the balances in the 14 telephone accounts among 40 to 50 asset types.

At present, depreciation studies are filed at 3-year intervals by the companies making up the Bell group. About one-third of the companies file each year. Over the next 5 years, 11 non-Bell firms, each with assets over \$35 million, will begin submitting depreciation studies if present FCC plans materialize.

*Ownership and use of assets*

In order to make estimates of the value of property used in providing telephone service, it is necessary to adjust for the value of assets rented from or to other industrial sectors. This adjustment requires information on the amount of rentals paid and received, the kind of asset rented, and the book cost of assets rented to other sectors.

The operating revenue and expense schedules (34, 35) provide, respectively, accounts for rent revenues and operating rents. No information is provided on the kind of property involved nor the book value of the rented assets for which revenues were received.

Rents received and paid for entire operating properties are recorded in accounts 302 and 303 on the income and earned surplus statement. Schedule 7 identifies the operating properties being leased but does not give the book value of properties leased to others.

Rental payments and receipts associated with miscellaneous physical properties are thrown into account 315 "Income from miscellaneous physical properties." Schedule 16, which identifies these properties individually, shows total revenues and total expenses associated with miscellaneous physical properties owned by the respondent, including those leased to others. The schedule also identifies each miscellaneous property owned by another and leased to the respondent.

*USITA report*

The report submitted to USITA by cooperating companies contains less of the data needed for wealth estimation purposes than does form M.

Tangible asset accounts include the following :

- Material and supplies.
- Telephone plant in service.
- Telephone plant under construction.
- Property held for future telephone use.
- Telephone plant acquisition adjustment.
- Telephone plant adjustment.

No separate account exists for "miscellaneous physical property." The primary accounts among which the balance in "telephone plant in service" is distributed are the same as those used in form M (itemized above).

The USITA report contains almost no information on rental payments and receipts. Only the revenues arising from the rent of telephone properties are shown separately.

We note, parenthetically, a second FCC report not heretofore discussed. Form L is completed by carriers engaged in domestic public land mobile radiotelephone service. Excluded from the reporting requirement are carriers already filing form M because of their land-line telephone operations. Form L requests only the book amount of investment in plant used in DPLMRS and the depreciated investment in other physical property.

By and large, basic data in the telephone industry are relatively adequate to provide a basis for current-value wealth estimates in considerable detail. The several data weaknesses in this area have been indicated in the course of the discussion.

#### TELEGRAPH COMMUNICATIONS

About two-thirds of the investment in plant of this industry is used in the operations of the Western Union Telegraph Co. The remaining investment is used in international radiotelegraph and ocean-cable service. In 1961 there were nine international carriers.

Annual reports are required by the Federal Communications Commission from telegraph carriers. Annual report form R is filed by radiotelegraph carriers; form O by wire-telegraph and ocean-cable carriers. Both annual forms share a high number of common schedules. Accordingly, we will review only form O, letting it serve also to illustrate data availabilities and gaps in form R.

#### *Value data by asset class*

The following balance sheet accounts relate to tangible assets:

- Operated plant in carrier's service (1000).
- Operated plant leased to others (1100).
- Improvements and repair of operated plant leased from others (1200).
- Plant under construction (1300).
- Plant held for future communication use (1400).
- Plant acquisition adjustments (1510).
- Telephone and radiotelegraph plant (1530).
- Plant in process of reclassification (1540).
- Plant adjustments (1545).
- Foreign investment in communication plant (1599).
- Miscellaneous physical property (1610).
- Material and supplies (1795).

The adjustment accounts can be ignored. Supporting schedules exist for "Operated plant in carrier's service," "Miscellaneous physical property," and "Materials and supplies."

Detail for the first of these accounts can be regrouped into the recommended asset classes for wealth purposes. Available detail for "Operated plant in carrier's service" includes:

- Land used for right-of-way (11).
- Land used for building sites (12).
- Land used for other operations (13).
- Land improvement (14).
- Buildings (15).
- Poles (21).
- Aerial wire (22).
- Aerial cable (23).
- Underground cable (24).
- Buried cable (25).
- Submarine cable (26).
- House cable (27).
- Underground conduit (28).
- Pneumatic tubes (29).
- Ocean cable (31).
- Message transmitting and receiving equipment (41).
- Repeater and terminal equipment (42).
- Switchboards and distribution frames (43).
- Pneumatic tube and conveyor equipment (44).
- Power equipment (45).
- Messenger call-circuit equipment (46).
- Time-service equipment (47).
- Ticker and commercial news service equipment (48).
- Office cable and conduit (49).
- Equipment furnished customers (51).
- Other inside commercial plant (59).
- Furniture and office appliances (61).
- Messenger uniforms (65).
- Other office and messenger equipment (69).
- Vehicles (71).
- Shop equipment (72).
- Store and warehouse equipment (73).
- Tools and implements (74).
- Floating equipment (75).
- Railway equipment (76).
- Emergency facilities (77).
- Laboratory equipment (78).
- Organization (81).
- Franchises (82).
- Patent rights (83).
- Leaseholds (84).
- Research and development (85).
- Other intangibles (89).
- Plant acquired—undistributed charges (91).
- Plant sold—undistributed credits (92).

Schedule 110 which supports "Miscellaneous physical property" supplies this information:

- Description and location.
- Date originally included in account. •
- Balance at end of year (gross).

The "Material and supplies" balance is supported by schedule 140 which provides this detail:

- Material held for use in carrier's communications operations.
- Material in process.
- Merchandise known to be held predominately for sale or resale, or for use in jobbing or contracting operations.
- Materials and supplies held for other than communications operations.
- Undistributed supply items.

*Value data by State of location*

The annual report does not distribute tangible asset balances by State of location. We recommend the collection of data needed to make this allocation.

*Ownership and use of assets*

Creation of a wealth statement showing the use of assets by industry requires an adjustment of industrial ownership data for the assets rented to and from other industrial sectors. The rental receipts and payments of telegraph companies are recorded in the following accounts of the income and earned surplus statement (schedule 300) and supporting schedules:

Account No.	Name of account	Supporting schedules
3000	Operating revenues.....	301T-C.
3410	Leased circuit revenue.....	308.
3415	Measured service revenue.....	308.
3420	Other leased-plant revenue.....	308.
3810	Leased circuit revenue.....	308.
3820	Other leased plant revenue.....	308.
4000	Operating expenses.....	330T-C.
4269	Rents for other facilities.....	333T-C.
4261	Rents for operating offices.....	333T-C.
4499	Other administrative expenses (in part).....	333T-C.
5010	Income from operated plant leased to others.....	
5015	Income from telephone and radiotelegraph plant leased to others.....	
5110	Income from miscellaneous physical property.....	
5205	Rent for lease of operated plant.....	362.

Supporting schedule 308 identifies each lessee if affiliated with the telegraph company. Leased properties are described and the rental amount is shown. Transactions with nonaffiliated lessees are grouped.

Balances in accounts 5010, 5015, and 5205 are net of expenses associated with rental properties. However, schedule 362, which supports account 5205, shows the gross annual rent accrual as well as the net income balance carried into account 5205. The schedule also provides a description of each property, including location. Rentals involving amounts less than \$5,000 may be grouped.

Account 5110 is used to record net income from noncarrier operations. Thus, it would reflect both rental payments and receipts associated with such operations. However, neither the properties involved nor the rental amounts are shown.

Schedule 333T-C provides a description of each property and the associated rental payment if the transaction involves an affiliated company and a payment of \$5,000 or more. Otherwise, entries may be grouped.

If balances actually existing in the accounts reviewed above involve significant amounts, it is clear that additional information will have to be collected from telegraph companies since the supporting schedules do not uniformly provide what is required. The value of facilities leased to others, the kind of asset rented to or from other sectors, and the associated rental receipt and payment require determination.

#### BROADCASTING

The provision of broadcast service is regulated by the Federal Communications Commission. In 1962 there were 8,500 television and radio broadcast stations. Of these, about 2,500 engaged in a relay operation involving the rebroadcast of television programs originated elsewhere. Rebroadcast facilities are often owned by local groups of television viewers. The FCC does not require an annual financial report from these relay broadcasters.

The remaining 6,000 radio and television stations (as well as the networks) file financial information in annual report form 324. A separate report is required of each network and station.

Form 324 calls for the following information on the value of tangible broadcast properties:

- Land and land improvements and buildings.
- Tower and antenna systems.
- Transmitter equipment.
- All other property.

In order to distribute these balances among the recommended asset classes for wealth purposes, it is necessary to separate the values associated with land, structures, equipment, and transport vehicles.

There should be little problem in distributing asset values by State of location given the fact that a separate report is completed by each broadcast station. We would expect that broadcast properties ordinarily are physically located in the same State as the station.

Form 324 provides no information on the rental of capital assets, data needed for the estimation of wealth by industry of use.

#### OTHER COMMUNICATION SERVICES

Available data indicate that fewer than 100 business units were classified within this industry. Included within the industry are photo-transmission companies and various communication leasing services, e.g., telephoto and stock ticker. We know of no current reporting vehicle for companies within the industry. We recommend the collection of required data. FCC may have an interest in some of these communications services, even though the agency has no present regulatory responsibilities toward companies providing them. The FCC might want to develop a data collection program. The census of business is a possible alternative data gathering vehicle.

## III. ELECTRIC, GAS, AND SANITARY SERVICES

These industries are within SIC major group 49:

Electric companies and systems.....	(4911)
Natural gas transmission.....	(4922)
Natural gas transmission and distribution.....	(4923)
Natural gas distribution.....	(4924)
Mixed manufactured or L.P. gas production and/or distribution.....	(4925)
Electric and other services combined.....	(4931)
Gas and other services combined.....	(4932)
Combination companies and systems, not elsewhere classified.....	(4939)
Water supply.....	(4941)
Sewerage services.....	(4952)
Refuse systems.....	(4953)
Sanitary services, not elsewhere classified.....	(4959)
Steam supply.....	(4961)
Irrigation system operation.....	(4971)

## ELECTRIC COMPANIES

In 1961 an estimated \$48.1 billion of electric utility plant were on the books of investor-owned electric companies. About 99 percent of this total was accounted for by the 225 electric utilities with operating revenues of \$1 million or more. These firms are required to report to the Federal Power Commission on that agency's form No. 1.<sup>1</sup> Nearly all cooperatively owned electric utilities report to the Rural Electrification Administration. In 1961, there were some 900 REA cooperative borrowers with utility plant valued at \$3.7 billion. Cooperatives that have repaid their REA loans are not required to file periodic reports. At the end of 1961, there were 24 utilities in this category.<sup>2</sup>

The information contained in the FPC and REA reports will now be considered in the light of requirements for wealth measurement.<sup>3</sup>

*Value data by asset class*

The balance sheet (statement A) of FPC form No. 1 contains the following items relating to tangible assets:

- Utility plant (101-107, 114).
- Utility plant adjustment (116).
- Nonutility property (121).
- Materials and supplies (151-159, 163).

The "Utility plant" balance is classified in statement B by kind of utility plant, (i.e., whether electric plant, gas plant, specified "other"

<sup>1</sup> Some of the companies whose assets account for the remaining 1 percent report on form No. 1-F. Given the relative insignificance of these companies, form No. 1-F will not be discussed below.

<sup>2</sup> The utility enterprise assets of Federal, State, and local governments are included in the wealth of the public sectors. The publicly owned electric utilities reporting to FCC in 1960 showed \$4.3 billion of electric utility plant. The FCC estimates that this figure represents 70 percent of the publicly owned plant excluding federally owned projects and New York's Niagara and St. Lawrence projects. Major Federal projects and the reported electric plant in billions of dollars include Bonneville (\$0.5) and TVA (\$2.1); the New York State projects report \$0.9 billion of electric plant.

<sup>3</sup> The Edison Electric Institute also receives a standardized report from electric utilities. The report will not be reviewed here since the industry is covered completely by the FPC and REA statistical systems.

plant, or common plant) and then spread among the following accounts:

- Plant in service (classified) (101).
- Plant purchased or sold (102).
- Completed construction not classified (106).
- In process of reclassification (103).
- Leased to others (104).
- Held for future use (105).
- Construction work in progress (107).
- Acquisition adjustments (114).

Supporting schedules exist for each item on the balance sheet and almost every electric plant account on statement B. (The two adjustment accounts can be ignored.) A schedule also exists for "common plant." The FPC annual report for public utilities does not require further detail on gas or "other" utility plant.

The supporting schedule for account 101 "Electric Plant in Service Classified" distributes the balance among the 65 accounts listed in annex B. Three of the accounts refer to intangible properties and can be ignored. The remaining accounts refer to a particular asset type within a particular functioning grouping. Thus, account 310 refers to land and land rights associated with steam production plant while account 350 refers to land and land rights associated with transmission plant. The accounts can be regrouped into the recommended capital asset classes for wealth estimates.

The schedule for account 104 shows for each leased property the name of the lessee, a description of the property, and its end-of-year book value. The description, location, and book value of electric plant held for future use are shown in the schedule supporting account 105. Each project classified as "Construction Work in Progress" is described in the schedule supporting account 107. Reporting electric companies are required to furnish a schedule describing common utility plant and the book cost of such plant.

Two major balance sheet items (statement A) remain for discussion. A "Materials and Supplies" schedule distributes the balance among 10 primary accounts:

- Fuel stock (151).
- Fuel stock expenses undistributed (152).
- Residuals and extracted products (153).
- Plant materials and operating supplies (154).
- Merchandise (155).
- Other materials and supplies (156).
- Nuclear fuel assemblies and components—in reactor (157).
- Nuclear fuel assemblies and components—Stock account (158).
- Nuclear byproduct material (159).
- Store expense undistributed (163).

Balances in account 154 are spread among various classes of material in a supporting schedule. Likewise, the quantity and cost of each type of fuel are shown in a schedule supporting account 151.

A supporting schedule exists for the end-of-year balance in "non-utility property." Each property is identified and the location is stated along with its cost. Properties under lease to another company are identified.



*Location of assets*

We have recommended elsewhere that wealth estimates be prepared for each State. Since book values represent the starting point for these estimates, we would like to have book values on a State-by-State basis. The FPC does not require this distribution of values in its form No. 1. However, we note that the uniform system of accounts imposes the following requirement on electric utilities:

Separate records shall be maintained by electric plant accounts of the book cost of each plant owned, including additions by the utility to plant leased from others, and of the cost of operating and maintaining each plant owned or operated. The term "plant" as here used means each generating station and each transmission line or appropriate group of transmission lines.

These already existing records should facilitate the localization at the primary account level of slightly more than half the investment in electric utility plant.

Property records on distribution plant and general plant are not required to be kept on a plant-by-plant basis. However, we would expect that the balances in the various distribution and general primary accounts could be distributed by State. This expectation is based on our knowledge of the comparative completeness of utility property records as well as the impetus given State-by-State recordkeeping by State regulatory and taxing agencies.

Hydroelectric plants located on rivers which serve as State boundaries present an allocation problem. One solution would be to distribute the assets to the State making major use of the output.

*Ownership and use of assets*

In constructing a statement of wealth by industry of use, the value of tangible assets owned by electric utilities must be adjusted for the lease of properties to and from other industries.

Rental payments and receipts are thrown into the following income, operating revenue, and operating expense accounts:

Operating revenues (400):

Rent from electric property (454).

Interdepartmental rents (455).

Operating expenses:

Operation Expenses (401):

Rents (507, 525, 540, 550, 567, 589, 931).

Income from utility plant leased to others (412, 413).

Income from nonutility operations (417).

Nonoperating rental income (418).

The schedule supporting accounts 454 and 455 describes each major leased property, identifies the lessee (or department) and the amount of revenue received (or credited). Revenues recorded in these accounts arise from the rent of properties devoted to electric operations. This raises the dual problems of determining the book cost of jointly used properties and of allocating the cost to the several industries of

use. Inspection of reported revenue data may show that these rental receipts are relatively insignificant.<sup>4</sup>

The several functional rent expense accounts (507, 525, etc.) appear to be used in large part to record the payments for plant leased from other electric utilities. Under these circumstances no allocation of book cost is necessary since industries of ownership and use are identical. The same reasoning applies to account 412 wherein are recorded revenues from the lease of electric plant to others. The rent expense accounts referred to above are supported by a schedule which describes each leased property (if the annual rental exceeds a certain amount), identifies the lessor, and shows the annual rental. A supporting schedule also exists for utility plant leased to others. Revenues and expenses associated with each operating unit are given as well as the name of the lessee and a description of the property, including its location.

Rental payments for equipment are included within expense accounts other than the above rent accounts. For example, the payments for the lease of transportation equipment in connection with distribution operations are not recorded in account 589 (Distribution rent expenses); rather they may be spread among "Distribution station expenses" (582), "Underground line expenses" (584), "Meter expenses" (586), etc. It will be necessary for at least a sample of reporting utilities to show separately rental payments by asset type, perhaps using a one-time supplement to the FPC report.

Accounts 417 and 418, relating to nonutility properties either operated or rented to others, are supported by a schedule. Each non-utility operation is described. Each major item of nonutility property leased to others is described and the associated rental revenue is given. The supporting schedule for "nonutility property" (reviewed with the other asset accounts) associates each property with its book cost.

#### *REA cooperative borrowers*

The periodic reports filed with REA by cooperative borrowers contain considerably less detail than required in the FPC form. However, these cooperatives could furnish additional required data distributed among accounts generally consistent with those used by FPC-regulated firms, since the system of accounts followed by REA borrowers is patterned after that prescribed by FPC.

In our review of the FPC report, we noted the presence of accounts and schedules relevant to wealth estimation as well as the absence of certain data. Hence, it is necessary to touch only briefly on the contents of the report filed by cooperatives, given the similarity in reporting.

The present REA report consists, for our purposes, of a monthly balance sheet and operations statement (form 7 or form 12a) and an

<sup>4</sup> Electric utilities with gas or other specified utility departments report rental receipts and expenses associated with the "other" utility operation in the following accounts:

Operating revenues.

Operating expenses:

Operation expense.

Income from utility plant leased to others.

Reporting electric companies show the same information about nonelectric department utility plant leased to others as they do for leased electric plant. No detail is provided on operating rental revenues and expenses.

annual supplement (form 40 or form 12h) which provides detail on the electric plant. The monthly report contains five balance sheet accounts related to tangible assets:

- Total utility plant in service.
- Construction work in progress.
- Nonutility property—Net.
- Materials and supplies—Electric.
- Materials and supplies—Merchandise.

In the annual supplement, electric plant is distributed among the following functional accounts:

- Intangible.
- Steam production.
- Hydraulic production.
- Other production.
- Transmission.
- Distribution.
- General.
- Purchased or sold.
- Leased to others.
- Held for future use.
- Not classified.
- Construction work in progress.
- Acquisition adjustments.

The report does not distribute tangible assets by type, i.e., by primary account.

The reported information on rents paid and received is poor. Rentals generally are not identified as separate revenue and expense items. Rented assets are not identified by type. This additional information would have to be obtained if rents are at all significant.

#### GAS COMPANIES

The gross book value of investor-owned gas utility plant was estimated at \$23.9 billion in 1962.<sup>5</sup> About \$10.2 billion represented the investment of natural gas transmission companies; \$13.7 billion was on the books of gas distribution companies. All but \$0.5 billion of the latter amount related to natural gas plant.<sup>6</sup>

The Federal Power Commission requires periodic reports from natural gas firms engaged in interstate commerce. Companies with gas operating revenues of \$1 million or more annually file FPC form No. 2. Smaller companies file form No. 2-A, a much-abbreviated version of the senior report. Since the smaller companies account for a very small part of the interstate business, no further attention will be given here to their report.

Most natural gas distribution firms either do not engage in interstate commerce or have had the reporting requirements waived, and accordingly some 45 percent of the industry's tangible assets are not covered

<sup>5</sup> Natural gas production properties accounted for almost \$3 billion of this total. These assets should be counted as part of the "crude petroleum and natural gas" industry, SIC 1311.

<sup>6</sup> Not included in any of these totals are \$0.8 of gas plant owned by public bodies. Of course, these assets constitute a part of State and local government wealth.

by FPC reports. Most of these companies—as well as those producing and selling gas other than natural—complete the uniform statistical report of the American Gas Association (New York, N.Y.). (AGA also receives reports from companies regulated by FPC.)

This report does not provide the detail found in the FPC form. However, the AGA report represents a possible vehicle for the collection of additional information from companies not regulated by FPC. We do not believe that respondents would have difficulty in providing additional consistent detail. This follows from the fact that at least 40 of the States prescribe systems of accounts for privately owned gas companies. These systems are consistent in their major aspects with the FPC accounts.

We now consider the contents of the FPC and AGA reports as they relate to our data requirements. We note at the outset that most of the accounts and schedules of the FPC gas report are identical to those found in the FPC electric company report. Accordingly, we will focus mainly on those aspects of the former report which differ from the latter.

The balance sheet (statement A) of FPC form No. 2 contains the following items relating to tangible assets:

- Utility plant (101-107, 114).
- Utility plant adjustments (116).
- Gas stored underground, noncurrent (117).
- Nonutility property (121).
- Materials and supplies (151-159, 163).
- Gas stored underground, current (164).

Except for the two gas accounts, these items and supporting schedules are identical with those in the electric company report. The schedule supporting the gas accounts shows the number of cubic feet of gas represented by the dollar balances in the two accounts. The uniform system of accounts requires the maintenance of separate records for each gas storage project. Presumably, such records would facilitate a State-by-State distribution of assets in the two accounts.

Statement B, which supports the "utility plant" item, is the same statement found in the already reviewed electric form. Except for the "gas plant in service" schedule, the supporting schedules are identical.

"Gas plant in service" is spread among more than 70 accounts. These are itemized in annex C to this chapter. Each account relates to a particular asset type associated with a particular function, e.g., production plant, transmission plant, etc. The present grouping of accounts is consistent with the recommended classification of gas utility wealth by function. The recommended alternative classification, i.e., by asset type, can be accomplished by regrouping the accounts.

In connection with the preparation of wealth estimates by State, we note that gas companies must maintain separate records by plant accounts for each plant. This should facilitate the localization of book costs.

Rental payments and receipts in connection with the operations of gas companies are recorded in a set of accounts paralleling the set described for electric companies. The same problem would arise in using the former set to allocate wealth from sector of ownership to

sector of use as became evident during our review of the electric company accounts.

*AGA report*

The AGA's uniform statistical report does not request balance sheet data in as much detail as the FPC report. Tangible assets are reported in the following accounts:

- Utility plant:
  - Electric.
  - Gas.
  - Other.
  - Common.
- Other property and investments (net).
- Gas stored underground (current).
- Materials and supplies.

The balances pertaining to each kind of utility plant are spread in turn among:

Electric:

- Intangible plant.
- Production plant.
  - Steam production.
  - Nuclear production.
  - Hydro production.
  - Pumped storage production.
  - Internal combustion production.
- Transmission plant.
- Distribution plant.
- General plant.
- Miscellaneous plant.<sup>7</sup>
- Construction work in progress.
- Plant acquisition adjustments and other adjustments.

Gas:

- Intangible plant.
- Production and local storage.
- Underground storage.
- Transmission.
- Distribution.
- General.
- Miscellaneous plant.<sup>7</sup>
- Construction work in progress.
- Plant acquisition adjustments and other adjustments.

Other utility plant:

- \_\_\_\_\_ (specify).
- Common plant (electric, gas, water, etc.).

It will be necessary to collect additional data at the level of the primary account in order to regroup these assets by type.

The AGA form does not show rental payments and receipts as separate items. Information relating to rental properties will have to be collected in order to create wealth statements on both ownership and use bases.

<sup>7</sup> Includes plant purchased or sold; in process of reclassification; leased to others; held for future use; completed construction not classified.

## COMBINATION COMPANIES

Combination companies providing electric and/or gas services file the same report(s) as the straight companies whose reports were reviewed above. Sources of data on water plant, including that owned by combination companies providing water service, will be reviewed in the next section. That leaves for consideration here the kinds of data available on the combination-company assets dedicated to the provision of a utility service other than electric, gas, and water.

If the "other" service is performed by a company reporting to FPC, the "other" service assets are shown in the following detail:

- Plant in service (classified).
- Plant purchased or sold.
- Completed construction not classified.
- In process of reclassification.
- Leased to others.
- Held for future use.
- Construction work in progress.
- Acquisition adjustment.

The AGA form aggregates the nonelectric "other" service assets of gas companies by service. More detail will have to be collected in order to distribute these assets by type. Information on rentals also will have to be obtained in order to construct wealth statements by industries of ownership and use.

We know of no reporting vehicle for combination utility companies offering neither gas nor electric service.

## WATER COMPANIES

No agency of the Federal Government currently collects financial data from water utilities. However, the Public Health Service periodically requests information on physical facilities in line with that agency's interest in safe water supplies. Every 5 years the PHS "Inventory of Municipal Water Facilities" is sent to each utility serving 100 or more persons. Water utilities serving communities with a population of 25,000 and over receive a questionnaire every 2 years.

At 5-year intervals the American Water Works Association, Inc. (New York, N.Y.), circulates a questionnaire to large water utilities. In 1955 about half of the 1,000 questionnaires mailed by AWWA were completed and returned. There are 24,000 water utilities in the United States of which 3,400 are privately owned.

Each of the report forms used in the 1960 survey contained a question on water utility plant. The shorter of the two forms used requested only total investment in utility property. The more comprehensive report (apparently intended for larger utilities) requested book values distributed as follows:

- Supply works and transmission lines.
- Treatment plant.
- Distribution system.
- General property.

Most States regulate privately owned water utilities and require annual reports. These reports are the only current source for detailed financial data. The general comparability of the reports submitted by companies in about 20 of the States is assured, given the fact that these States prescribe the system of accounts developed by the National Association of Railroad & Utilities Commissioners. In terms of what we need to know about tangible assets, we are unable to assess the significance of the diversity in accounting systems followed in the other 20 States that require annual reports.

In connection with the use of State reports as a data source for wealth estimates—this being a possible alternative to a special census or survey—we are informed that a private organization currently is gathering detailed financial data from the reports filed in each State that regulates water utilities.<sup>8</sup>

The NARUC system of accounts required in about 20 States is similar in structure to the electric and gas accounting system already reviewed. The balance sheet for large water utilities contains the following items relating to tangible assets:

- Utility plant (101–106).
- Construction work in progress (107).
- Utility plant adjustments (117–119).
- Nonutility property (12).
- Materials and supplies (151–163).
- “Utility plant,” in turn, is spread among:
  - Utility plant in service classified (101).
  - Utility plant purchased or sold (102).
  - Utility plant in process of reclassification (103).
  - Utility plant leased to others (104).
  - Property held for future use (105).
  - Completed construction not classified (106).
  - Utility plant other than water.

“Water utility plant in service classified” is distributed among about 40 asset classes within 6 functional plant categories. These are detailed in annex D.

Rentals are recorded in the following income, revenue, and expense accounts:

- Operating revenues (400).
  - Rents from water property (472).
  - Interdepartmental rents (473).
- Operation expense (401).
  - Rents (604, 627, 644, 666, 931).
- Income from utility plant leased to others (412–413).
- Nonoperating rental income (418).

Schedules supporting amounts recorded in the last two lines above provide the following information. “Utility plant leased to others” is identified along with the book cost and rental revenues. The supporting schedule for account 418 identifies the property and shows the rental revenue but not the book value of the property.

<sup>8</sup> The organization is headed by James B. Corey, Plainfield, N.J.

## OTHER UTILITY SERVICES

There are about 700 privately owned sewerage systems. Information on these as well as publicly owned facilities is collected by means of periodic PHS-State inventories. No financial-type data are requested from respondents. Sewerage companies are regulated in only a few States, and hence, their reports could not serve as the basis for State-by-State wealth estimates. The same conclusion follows from the pattern of regulation of steam companies. These enterprises are regulated in half the States.<sup>9</sup>

Irrigation companies—both privately and publicly owned—are the subject of a decennial census in connection with every other census of agriculture. The most recent census covered every irrigation enterprise serving three or more farms. The questionnaire did not request balance sheet-type data.

We know of no sources of data on the two remaining sanitary service industries, i.e., "refuse systems" and "sanitary services, not elsewhere classified." The required data about these industries as well as the sewerage and steam supply industries could be collected by the Bureau of the Census.

## ANNEX A

## SUPPLEMENTAL COMMENTS OF DAVID A. KOSH AND GERALD J. GLASSMAN

We disagree that the value of the tangible assets of regulated utilities can be measured by historical costs trended by price indexes. Patterning the valuation of utility wealth after the current value criteria used in the other economic sectors provides only a misleading semantic consistency.

It is correctly stated that most States establish ratemaking values which approximate depreciated original cost. Since this is true, it must be incorrect that historical costs adjusted by price indexes to a current price level provide a meaningful measure of economic value for regulated utilities. It is conceded that in general a theoretically correct value should be determined by a discounting of expected future income flows. Trended original cost, original cost, or cost of reproduction are only practical substitutes for the difficulties involved in the capitalized income approach. Future income flows of regulated utilities are determined principally by the ratemaking value or rate base set by regulation and the rate of return applied to this value by regulation. If the allowed and realized rate of return is equal to the market capitalization rate, then the market value of securities would equal the rate base. Since the rate base is depreciated original cost, then under an assumption of continuous, efficient regulation, market value would tend to equal depreciated original cost in the long run. It is this economic market value which is the proper wealth measure for regulated utilities. Of course, economic value can differ from rate base values if earnings actually realized differ from the earnings which are required in the money market: if the realized rate of return differs from the market capitalization rate.

In actuality, rates of return generally exceed market capitalization rates. This brings value above the depreciated original cost rate base, but still provides no discernible link to a trended original cost. Cost trended for price level changes must, by definition, be an indication of value only rarely and then by coincidence. As long as regulation is founded principally on original cost depreciated, this is a measure of value superior to trended original cost. If a swing back to reproduction cost depreciated regulation were to eventuate, then and only then would trended original cost be a better measure.

If original cost or book cost were used as the measure of gross value, then book depreciation reserves would be the best measure of accrued consumption of original cost to arrive at a net value measure. We need not concern ourselves particularly with full reflection of obsolescence, since, in general, regulation accepts book-recorded depreciation in estimating net book cost.

<sup>9</sup> For a summary of the extent of State utility regulation, see Federal Power Commission, "State Commission Jurisdiction and Regulation of Electric and Gas Utilities, 1960."



The valuation method proposed by the report, trended original cost less an estimate of accrued economic depreciation reflecting expired service life, plus obsolescence, will provide a meaningful value estimate for the utilities in only one State, Ohio. For the regulated industries in total, the proposed method will yield a figure which cannot possibly approximate value in the sense defined for the wealth inventory.

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ANNEX B

FPC ELECTRIC PLANT IN SERVICE ACCOUNTS

*1. Intangible plant*

- 301 Organization
- 302 Franchises and consents
- 303 Miscellaneous intangible plant

*2. Production plant*

STEAM PRODUCTION PLANT

- 310 Land and land rights
- 311 Structures and improvements
- 312 Boiler plant equipment
- 313 Engines and engine-driven generators
- 314 Turbogenerator units
- 315 Accessory electric equipment
- 316 Miscellaneous powerplant equipment

NUCLEAR PRODUCTION PLANT

- 320 Land and land rights
- 321 Structures and improvements
- 322 Reactor plant equipment
- 323 Turbogenerator units
- 324 Accessory electric equipment
- 325 Miscellaneous powerplant equipment

HYDRAULIC PRODUCTION PLANT

- 330 Land and land rights
- 331 Structures and improvements
- 332 Reservoirs, dams, waterways
- 333 Water wheels, turbines, and generators
- 334 Accessory electric equipment
- 335 Miscellaneous powerplant equipment
- 336 Roads, railroads, bridges

OTHER PRODUCTION PLANT

- 340 Land and land rights
- 341 Structures and improvements
- 342 Fuel holders, products and accessories
- 343 Prime movers
- 344 Generators
- 345 Accessory electric equipment
- 346 Miscellaneous powerplant equipment

*3. Transmission plant*

- 350 Land and land rights
- 351 Clearing land and rights-of-way
- 352 Structures and improvements
- 353 Station equipment
- 354 Towers and fixtures
- 355 Poles and fixtures
- 356 Overhead conductors and devices
- 357 Underground conduit
- 358 Underground conductors and devices
- 359 Roads and trails

*4. Distribution plant*

360	Land and land rights
361	Structures and improvements
362	Station equipment
363	Storage battery equipment
364	Poles, towers, fixtures
365	Overhead conductors and devices
366	Underground conduit
367	Underground conductors and devices
368	Line transformers
369	Services
370	Meters
371	Installation on customer's premises
372	Leased property on customer's premises
373	Street lighting and signal systems

*5. General plant*

389	Land and land rights
390	Structures and improvements
391	Office furniture and equipment
392	Transportation equipment
393	Stores equipment
394	Tools, shop and garage equipment
395	Laboratory equipment
396	Power-operated equipment
397	Communication equipment
398	Miscellaneous equipment
399	Other tangible property

## ANNEX C

## FPC GAS PLANT IN SERVICE ACCOUNTS

*1. Intangible plant*

301	Organization
302	Franchises and consents
303	Miscellaneous intangible plant

*2. Production plant*

## NATURAL GAS PRODUCTION AND GATHERING PLANT

325.1	Producing lands
325.2	Producing leaseholds
325.3	Gas rights
325.4	Rights-of-way
325.5	Other land and land rights
326	Gas well structures
327	Field compressor station structures
328	Field measuring and regulating station structures
329	Other structures
330	Producing gas wells—well construction
331	Producing gas wells—well equipment
332	Field lines
333	Field compressor station equipment
334	Field measuring and regulating station equipment
335	Drilling and cleaning equipment
336	Purification equipment
337	Other equipment

## PRODUCTS EXTRACTION PLANT

340	Land and land rights
341	Structures and improvements
342	Extraction and refining equipment
343	Pipelines
344	Extracted products storage equipment
345	Compressor equipment
346	Gas measuring and regulating equipment
347	Other equipment

## MANUFACTURED GAS PRODUCTION PLANT

*3. Storage plant*

350.1	Land
350.2	Leaseholds
350.3	Storage rights
350.4	Rights-of-way
350.5	Gas rights
351	Structures and improvements
352	Wells
353	Lines
354	Compressor station equipment
355	Measuring and regulating station equipment
356	Purification equipment
357	Other equipment

## LOCAL STORAGE PLANT

360	Land and land rights
361	Structures and improvements
362	Gas holders
363	Other equipment

*4. Transmission plant*

365.1	Land and land rights
365.2	Rights-of-way
366	Structures and improvements
367	Mains
368	Compressor station equipment
369	Measuring and regulating station equipment
370	Communication equipment
371	Other equipment

*5. Distribution plant*

374	Land and land rights
375	Structures and improvements
376	Mains
377	Compressor station equipment
378	Measuring and regulating station equipment—general
379	Measuring and regulating station equipment—city gate
380	Services
381	Meters
382	Meter installations
383	House regulator
384	House regulator installations
385	Industrial measuring and regulating station equipment
386	Other property on customer's premises
387	Other equipment

*6. General plant*

389	Land and land rights
390	Structures and improvements
391	Office furniture and equipment
392	Transportation equipment
393	Stores equipment
394	Tools, shop and garage equipment
395	Laboratory equipment
396	Power-operated equipment
397	Communication equipment
398	Miscellaneous equipment
399	Other tangible property

## ANNEX D

## NARUC WATER PLANT IN SERVICE ACCOUNTS

*Intangible plant*

301	Organization
302	Franchises and consents
303	Miscellaneous intangible plant

*Source of supply plant*

310	Land and land rights
311	Structures and improvements
312	Collection and impounding reservoirs
313	Lake, river and other intakes
314	Wells and springs
315	Infiltration galleries and tunnels
316	Supply mains
317	Other water source plant

*Pumping plant*

320	Land and land rights
321	Structures and improvements
322	Boiler plant equipment
323	Other power producing equipment
324	Steam pumping equipment
325	Electric pumping equipment
326	Diesel pumping equipment
327	Hydraulic pumping equipment
328	Other pumping equipment

*Water treatment plant*

330	Land and land rights
331	Structures and improvements
332	Water treatment and equipment

*Transmission and distribution plant*

340	Land and land rights
341	Structures and improvements
342	Distribution reservoirs and standpipes
343	Transmission and distribution mains
344	Fire mains
345	Services
346	Meters
347	Meter installations
348	Hydrants
349	Other transmission and distribution plant

*General plant*

389	Land and land rights
390	Structures and improvements
391	Office furniture and equipment
392	Transportation equipment
393	Stores equipment
394	Tool, shop, and garage equipment
395	Laboratory equipment
396	Power operated equipment
397	Communication equipment
399	Other tangible property

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APPENDIX II: PART N

REPORT OF THE WORKING GROUP ON SERVICE  
INDUSTRIES WEALTH

Prepared by JOEL POPKIN

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MEMBERSHIP OF THE WORKING GROUP ON WEALTH IN THE  
SERVICE INDUSTRIES

- Gabriel Cherin, Business and Defense Services Administration, Department of Commerce.
- Victor R. Fuchs, member of the research staff, National Bureau of Economic Research.
- Diane B. Gertler, Division of Educational Statistics, U.S. Office of Education.
- Harvey Kailin, Business Division, Bureau of the Census.
- Lawrence McHugh (chairman), Committee for Economic Development.
- Howard E. Morgan, Business and Defense Services Administration, Department of Commerce.
- Joel Popkin (secretary), Wealth Inventory Planning Study, The George Washington University.
- William J. Smith, Jr., Internal Revenue Service, U.S. Treasury Department.
- Carolyn Wells, assistant for special projects, American Association of Museums.

## PREFACE

The Working Group on Wealth in the Service Industries was formed as part of the Wealth Inventory Planning Study. Its purpose has been to analyze the problems connected with, and prepare proposals for, the improvement of basic data and estimates required for a comprehensive inventory of the tangible wealth of the service industries—profit and nonprofit.

The working group met on September 24 and November 11, 1963. Some members prepared memorandums on the existing data in sectors with which they are especially familiar. These memorandums were presented at the meetings and incorporated in the final report.

The working group wishes to thank John W. Kendrick of the Wealth Study staff and Robert W. Schiedel of the Census Bureau for their suggestions and comments made at the meetings they attended.

While this report is the responsibility of the secretary, every attempt has been made to present the consensus of working group opinion. However, no member should be held responsible for all the views and recommendations contained in the report.

JOEL POPKIN.

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# THE SERVICE INDUSTRIES

## I. INTRODUCTION

### SCOPE

The scope of the sector assigned to the Working Group on Wealth in the Service Industries encompasses the following major groups, as defined in the 1957 "Standard Industrial Classification Manual" and its 1958 and 1963 revisions:

- 70 Hotels, rooming houses, camps, and other lodging places.
- 72 Personal services.
- 73 Miscellaneous business services.
- 75 Automobile repair, automobile services and garages.
- 76 Miscellaneous repair services.
- 78 Motion pictures.
- 79 Amusement and recreation services, except motion pictures.
- 80 Medical and other health services.
- 81 Legal services.
- 82 Education services.
- 84 Museums, art galleries, botanical, and zoological gardens.
- 86 Nonprofit membership organizations.
- 89 Miscellaneous services.

These thirteen 2-digit industries, plus major group 88, private households, which has been excluded from coverage here, comprise the services division, as defined in the SIC. The exclusion of major group 88 is based on the fact that it covers the services of domestic servants in private households. Since the tangible assets used to produce these services are largely owned by the household sector, they will be included in the scope of the Working Group on the Wealth of Households.

Certain service industries have important counterparts in the public sector. Examples are hospitals, educational services, and museums. Where provided by the Federal Government, these services are included in SIC 9180, 9182, and 9184, respectively; by State governments, in SIC 9280, 9282, and 9284; local governments, in SIC 9380, 9382, and 9384. The Working Group on Federal Government Wealth, and State and Local Government Wealth, have primary responsibility for these publicly provided services.

The services sector, as defined above, is a grouping of heterogeneous subsectors, data for which are sparse, incomplete, and collected by a number of different agencies—private and public. These data will be discussed in section II of the report.

### USES AND NEED FOR WEALTH DATA

There are many analytical uses for wealth data. These uses are elaborated in the report of the Wealth Inventory Planning Study staff. Aside from these uses, there are several reasons why a wealth inventory is particularly important for the sector covered by this working group.

There is very little information on the services sector, particularly in the nonprofit area. The emphasis on, and growth of, educational institutions, the rising importance of research and other activities supported by foundations, and the overall increase in the importance of services, which is characteristic of well-developed, mature economies, create the need for more data in these areas.

Estimates of the gross book value, at historical cost, of the tangible assets of the various service sectors appear and are discussed (including data sources and the methodology used in making the estimates) in section II of this report. Estimates for the profitmaking service industries, religious bodies, nongovernmental hospitals, and private higher educational institutions are firm enough to be of some use in gauging the tangible wealth of the sector as a whole. These data, for either 1959 or 1960, totaled \$56 billion. This total compares with \$53 billion for the reproducible fixed assets of the Federal Government excluding the Department of Defense, as of June 30, 1962. This \$56 billion figure is, also, about 51 percent of the \$110 billion gross book value of depreciable and depletable assets of manufacturers as of December 31, 1957. It should be remembered that the tangibles of museums, libraries, charitable foundations and organizations, and non-public elementary and secondary schools and junior colleges cannot now be estimated satisfactorily and therefore have not been included in this estimate for the service industries.

While the need for wealth and other data in the service industries is unequivocal, great obstacles, unique to this area, exist, which compound the difficulty of collecting such information. The service industries comprise a large number of small organizational units. The staffs of these organizations are usually small and are unable to devote much time to recordkeeping and providing information, such as that which would be needed for wealth estimates. In addition many of the organizations included here are tax exempt and are not required to keep extensive records for tax purposes.

In the face of these difficulties it is apparent that wealth data collected for the sector cannot be as detailed as those for other sectors where data are better. Accordingly, in the recommendations of the working group, found in section IV of this report, priorities have been set for the data objectives. While not all of the data objectives can be attained in time for the first wealth estimates (around the end of this decade), the working group feels that important first steps can, and should, be taken, thus laying the foundation for continued improvement and strengthening of the data in subsequent years.

## II. REVIEW OF EXISTING DATA

Since the sectors grouped together under the services division described in section I differ widely, it is convenient to regroup them in order to achieve a more consistent subsectoring. The regrouping which follows will serve as the framework for the remainder of this report:

(1) Private profitmaking service organizations—SIC 70 (except 704, organization hotels and lodgings on membership basis), 72, 73, 75, 76, 78, 79, (except 7947, golf clubs and country clubs with closed membership), 80 (except

hospitals, 806), 81, 824, 89 (except 892, nonprofit educational and scientific research agencies);

(2) Hospitals—SIC 806, broken down into private voluntary and proprietary hospitals;

(3) Private educational institutions including libraries—SIC 82 (except 824 which is composed of profitmaking correspondent and vocational schools, but including nonprofit educational and scientific research agencies—SIC 8921);

(4) Museums, art galleries, botanical and zoological gardens, not publicly owned—SIC 84;

(5) Labor unions and similar labor organizations—SIC 8631;

(6) Religious organizations—SIC 8661;

(7) Charitable organizations—SIC 8671; and

(8) Miscellaneous nonprofit membership organizations not elsewhere classified—business (SIC 8611), professional (SIC 8621), and political (SIC 8651) membership organizations, civic, social, and fraternal organizations (SIC 8641), organization hotels and lodginghouses on a membership basis (SIC 704), golf clubs and country clubs with closed membership (SIC 7947), and nonprofit membership organizations not elsewhere classified (SIC 8699).

This framework creates a distinction, important for analytical purposes, between profit and nonprofit organizations. Item (1), above, and proprietary hospitals comprise the former; items (3) through (8) and private voluntary hospitals constitute the latter.

#### THE PRIVATE PROFITMAKING SERVICE SECTOR

The Internal Revenue Service tabulates data from a sample of all firms which file income tax returns. These tabulations are presented in industry detail roughly similar to that of the standard industrial classification. IRS detail is different for each legal form of organization, since, for example, industry breaks important to the description of the corporate sector are likely to be different from those important to the partnership sector.

For the 1959-60 tax year, IRS received a total of 2,250,198 returns from firms which it classified in the service industry, a classification with a composition similar to that outlined above for the private, profitmaking, service sector. Of the total number of firms filing these returns, 5 percent were corporations, 7 percent partnerships, and 88 percent sole proprietorships. The 2.3 million returns received by the IRS for 1959-60 compare with 975,000 establishments covered in the services section of the 1958 Census of Business. This significant difference is due to several factors. First, Census covers services classified in division 7 industries, IRS, divisions 7 and 8; this difference accounts for 67 percent of the excess of IRS service firms over Census establishments. Second, IRS figures cover the year ending June 30, 1960, while the Census figure is based on 1958. Third, Census excluded roominghouses (SIC 702), while IRS includes them. On the other hand, Census, which covers establishments, should show a higher total than IRS whose basic reporting units are tax-filing organizations which could be multiestablishment. However, in 1958, the Census found that 95 percent of the service establishments canvassed were operated by single establishment companies.

While IRS coverage is virtually exhaustive, actual balance sheet data were available only for corporations and 50 percent of partnerships for the 1959-60 tax year. Those 50 percent of partnerships reporting balance sheet data accounted for 71 percent of the total receipts of all partnerships in the services industry. The only asset data on

sole proprietorships are those collected in schedule C, "Profit (or Loss) From Business or Profession," part of the individual income tax form. A section of this schedule—C-1—requests data on the cost and date of acquisition of assets for which depreciation is being claimed. IRS has not tabulated this information. Inventory data, requested in this schedule, are tabulated.

Table 1 presents estimates of gross tangible assets, including inventories and land for profitmaking service industries. These estimates are based on information from tax returns filed with the Internal Revenue Service for fiscal years ending from July 1, 1959, through June 30, 1960. Since 50 percent of partnerships and all sole proprietorships do not file balance sheets, the missing gross book value data had to be estimated. The methods used are described in footnotes to table 1.

TABLE 1.—Gross fixed assets, inventories, and land at book values of profitmaking service industry firms with tax years ending between July 1, 1959 and June 30, 1960

[Millions of dollars]

Category and rough SIC equivalent	Total gross fixed assets and land	Gross fixed assets			Land corporations and partnerships
		Corporations	Partnerships <sup>1</sup>	Sole proprietorships <sup>2</sup>	
Hotels, etc. (70 ex 704).....	8,126	3,591	1,082	2,780	673
Personal services (72).....	4,117	1,427	662	1,910	118
Business services (73).....	3,541	2,388	282	800	71
Auto repair, renting, parking and miscellaneous repair services (75, 76).....	3,710	1,861	821	880	148
Motion pictures (78).....	1,804	1,620	-----	-----	184
Amusement and recreation (79).....	3,768	1,483	548	1,561	176
Medical (80).....	2,596	-----	381	2,200	15
Legal (81).....	960	-----	180	778	2
Other services (824, 829, and 89).....	1,867	587	186	1,046	48
Total.....	30,489	12,957	4,142	11,955	1,435
Inventories.....	*1,405	-----	-----	-----	-----
Grand total.....	31,894	-----	-----	-----	-----

<sup>1</sup> The data for partnerships represent the universe and were obtained by inflating gross book value data for depreciable and depletable assets, for those partnerships reporting balance sheets, by the ratio of their receipts to total receipts for all partnerships in each 2-digit class.

<sup>2</sup> The figures for sole proprietorships were obtained by inflating the depreciation expense figure available, by the ratio of depreciation expense to gross fixed assets of partnerships filing balance sheets.

<sup>3</sup> Inventory estimates for the partnerships universe were obtained in the same manner as the gross book value totals described in footnote 1.

Source: IRS Statistics of Income.

Based on the application of these methods to tax data filed between July 1, 1959 and June 30, 1960, tangibles of profitmaking service industry firms totaled \$32 billion, valued at acquisition cost for reproducible and land, and reported value for inventories.

The IRS, also, collects some data on rents paid and rents received. The relevance of these data in estimating the value of leased assets is discussed in section III. The IRS totals for rents paid and received are not complete. Some firms consolidate rents paid in cost of goods sold; others report rents received together with business receipts.

The Census Bureau currently collects data on SIC's 70-79 (except for 702 and 704). The "service" trades within the scope of the census of business are hotels, motels, etc.; personal services; business services; repair services; motion pictures; and amusements; i.e., Major Groups

70 (except 702 and 704), 72, 73, 75, 76, 78, and 79. There are approximately 1 million service trade establishments within the census scope, with total receipts of about \$35 billion, an annual payroll of about \$10 billion, and paid employment of about 3 million persons. Of the 1 million firms, 81 percent are individual proprietorships, 10 percent, partnerships, and 9 percent, corporations. The census, which is conducted at 5-year intervals, makes a mail enumeration of all employers; data for nonemployers, however, are derived from a 50-percent sample of the business schedule (c) of the Federal individual income tax returns.

Census results are collected and, for the most part, are tabulated in terms of the individual establishment rather than on a "firm" or "company" basis. For the service trades, the data collected consist primarily of information for classifying the establishments by kind of business, form of organization, and location. The data include annual receipts, annual payroll, and payroll and employment in mid-November.

There is little information normally collected for the service trades which would appear to be directly useful in a census of wealth. Among the inquiries which do have some bearing on facilities or equipment are the following:

- (1) For auto and truck rental and leasing establishments:
  - (a) The number of vehicles at the close of the year by type of vehicle (i.e., trucks, truck tractors, etc.) and by type of rental or leasing arrangement.
  - (b) The number and dollar value, by type of vehicle, purchased, sold, and traded during the census year.
- (2) For laundry and cleaning establishments, the number of vehicles owned and the number leased.
- (3) For a number of trades (e.g., personal services, repair services, business services, amusement, and recreation services)—the number of coin-operated amusement machines, service machines, and vending machines operated.
- (4) For auto repair services—the number of gasoline pumps operated.
- (5) For hotels—the number of guest rooms; availability of certain facilities (e.g., swimming pool, golf course, etc.).
- (6) For motion picture theaters—seating (or car) capacity.

In connection with the 1958 census, a small sample survey was conducted to provide information on capital expenditures during the census year, with a breakdown into new structures and additions, new fixtures and equipment, and used structures, fixtures, and equipment. A similar survey is planned in connection with the 1963 census.

In the 1933 censuses form NC-K1, "Company Summary Form," will be sent to the approximately 10,000 firms which employ 250 or more persons. About 700 firms in the services sector (accounting for 21 percent of employment) will receive this form. They will report the gross (book) value and (net) depreciated value of depreciable and depletable assets, as of the beginning and end of 1963, for the company as a whole. In addition, the form calls for data on the components of change in gross book value during 1963—capital expenditures for plant and equipment, other acquired tangibles (due to mergers, etc.), depreciation and depletion charges, and assets sold or scrapped. Fi-

nally, a summary of total company assets will be requested, with a breakdown showing the net value of depreciable and depletable assets, all other domestic assets, and all foreign assets. Data on rental payments, shown separately for buildings and structures and machinery and equipment, will also be collected on the same form. The relevance of these rental data will be discussed in section III.

#### THE NONPROFIT SECTOR

IRS is a potential source of data for certain of the categories of nonprofit organizations, data availabilities for which will be discussed below. The Internal Revenue Code requires that annual income statements and balance sheets be filed by these organizations despite their tax-exempt status. The degree to which there is compliance with the code is not known. No tabulations of returns which have been filed have been made except for farm cooperatives. Nonprofit organizations exempted from filing are (1) religious organizations and certain affiliated organizations, (2) educational organizations maintaining regular facilities, (3) charities supported either by the general public or by the Federal Government or any political subdivision, and (4) fraternal organizations. All others must file annually one of the 990 series tax forms. Of all the tax-exempt organizations required to file annual returns for 1962, 276,000 returns were actually filed. IRS estimates that by 1980 it will have to process 581,000 such returns.

Where balance sheets are required, they provide for totals for depreciable and depletable assets, associated valuation reserves, and land.

The discussion which follows is mainly concerned with data, other than that of the IRS, which are available for the various categories of nonprofit organizations.

##### *Private voluntary and proprietary hospitals*

Hospital statistics are collected in an annual survey conducted by the American Hospital Association. The tabulations of the 1962 survey, the 17th in the series, appear in the August 1, 1963, issue of the Journal of the American Hospital Association. The survey covers registered hospitals which totaled 7,028 in 1962. Each hospital reports the total value of its plant which is defined as land, buildings, equipment, and reserves for construction, improvements, and replacement, less deductions for depreciation. Book cost is the basis of valuation. The total reported by the 4,613 hospitals privately operated in 1962 was \$7,650 million. This total included the tangible assets of both voluntary and proprietary hospitals, which accounted for 96 and 4 percent of the total, respectively.

It is understood that rough cost estimates for constructing new hospitals may be computed using \$20,000 per bed as a guide. On this basis, the gross replacement cost of the 557,047 privately operated beds would be \$11,141 million, compared with the \$7,650 million depreciated book value figure.

In the survey, data are obtained, also, on the intangibles of private hospitals, which were valued at \$2.9 billion at the end of 1962.

The Federal Government last collected data on hospitals as part of the 1935 Census of Business.

*Private educational institutions including libraries and nonprofit educational and scientific research organizations*

This section can be broken down into the following subsectors: (1) higher educational institutions, (2) nonchurch elementary and secondary schools, (3) church-operated secondary schools, (4) libraries, and (5) scientific research organizations.

The Office of Education of the Department of Health, Education, and Welfare has completed an exhaustive inventory of the facilities of higher educational institutions. The result of the survey are slated for publication under the title, "Inventory of College and University Physical Facilities, December 31, 1957," which will be part three of a five-part study, "College and University Facilities Survey." The survey forms the basis for a continuing inventory, building by building, of existing facilities at higher educational institutions. Responses to the survey were received from 85 percent of the higher educational institutions—public and private—in the United States and outlying areas which accounted for 96 percent of total enrollment in the fall of 1957. The data collected from the 1,664 respondents, covering 41,380 buildings, has been edited and coded for transfer to IBM cards. These data make possible the following breakdowns of buildings which are accompanied by their relevancy for wealth estimates:

1. Type of control (for sector of ownership detail) ;
2. Detail by State (for geographical detail) ;
3. Number of buildings by condition, function of assignable area, and size and capacity of various functional areas within each building ;
4. Plant-fund investment (historical cost data) ;
5. Date of original occupancy and date of rehabilitation, if any (age distribution necessary for revaluation, and depreciation estimates) ;
6. Type of construction (for selection of appropriate price index for revaluation) ;
7. Estimated valuation (for comparison with derived current-day value estimates).

In another report, "Financial Statistics of Institutions of Higher Education," data are presented biennially on various financial magnitudes including the book value of plant and changes therein. The plant data are broken down into land, buildings (including fixed equipment), improvements other than buildings, and equipment. The total value of plant, for the 1,311 private institutions reporting these data for their 1960 fiscal yearend, was \$5.7 billion. The instructions for the valuation of these tangibles called for "cost (or appraised value at time of acquisition, if a gift) except that library books may be valued either at cost or at \$1 per volume or other reduced arbitrary value. The book value of service property (such as powerplant) and of properties used for auxiliary enterprises may reflect an allowance for depreciation, if replacement costs are to be met from reserve funds established for this purpose out of income."

The American Council on Education publishes "American Universities and Colleges" which presents selected data, including plant and endowment figures for those universities and colleges, some part of the total, which report this information.

The American Council on Education also publishes a register entitled "American Junior Colleges" which presents data on nearly 600 junior colleges. Valuation figures for buildings and grounds are given for some, but not all, schools.

A complete register of senior and junior colleges is found in the "Education Directory, Part 3," published annually by the Office of Education.

There are few data available on private elementary and secondary schools, church or nonchurch. The most comprehensive body of data available is a census, taken in spring 1962, of instructional rooms in school plants. These data are broken down by State, by completion date (before or after 1920), combustibility, and location—in permanent buildings, nonpermanent buildings or offsite facilities. The inventory, collected for civilian defense needs, includes data from 93 percent of the nonpublic schools which enroll an estimated 84 percent of nonpublic elementary and secondary school pupils.

The "College Blue Book" series, published privately every 3 years, contains a register of secondary schools and institutions of higher education. The data on plant and equipment value for institutes of higher education provide less detail than those published by the Office of Education. The series, however, does provide a list of junior colleges and private elementary and secondary schools—church and nonchurch—but no data are given which could be used for wealth estimates.

The "Porter Sargent Handbook" provides similar information for almost 1,000 private, church and nonchurch, elementary and secondary schools. Value of plant, endowment, number of dormitory rooms, laboratories, books in library, and classrooms are given for many schools.

The most complete listing of nonpublic secondary schools, including both independent and church-related schools, is the Office of Education's "Directory of Nonpublic Secondary Schools, 1960-61."

Another approach in the church area is to obtain data directly from various religious groups which sponsor schools. This approach was used in connection with the 1936 "Census of Religious Bodies." The questionnaire for the census asked for the value (original cost) of church-operated school facilities but the information apparently was not tabulated. It is understood that currently some religious bodies do have fairly extensive data assembled on their school systems. These data include figures on the dollar value of physical facilities.

Fire insurance valuation data, if broad enough in coverage, is another possible source of data for nonpublic elementary and secondary school systems.

#### *Nonpublic museums, art galleries, botanical and zoological gardens*

Fragmentary data exist on the tangibles of this group. They consist mainly of figures on square feet of total floor space broken down by major use, and information on new additions, including cost, cost per cubic foot and type of construction. These data were collected (but have not been tabulated), through a survey questionnaire sent to almost 6,000 museums, etc., in 1958. A little more than 3,000 responses, covering either 1959 or 1960, were received.



An annex to this report contains a report on the assessment of the possibilities for valuing the collections of the institutions in the "museum" group.

#### *Labor unions and similar labor organizations*

Labor unions and related pension funds have been required, since 1960, to submit asset data to the Office of Labor-Management Reports of the Department of Labor. For large labor unions (annual receipts of \$30,000 or more), a fixed asset schedule requires information on land by specific location, buildings by specific location, automotive equipment, office furniture and equipment, and other fixed assets. A column is provided for depreciation taken up to the reporting date. Currently, only total assets are summarized, but totals on the detail for 1962 will be available soon.

For pension funds, data on operated real estate are collected. In addition, the funds report "other fixed assets" which is composed mainly of plant and equipment items used in connection with operating the pension fund; the total of these assets presumably is quite small. The detail contained in the schedule was not tabulated for 1960. Tabulations of total fixed assets have been completed, however, and the detail for 1962 will be available shortly. The total assets—tangible and financial—of labor unions, for their 1960 fiscal yearends, amounted to \$700 million, of labor union pension funds, \$33 billion.

Business Week magazine, in its issue of June 4, 1960, published data taken from the forms filed with the Labor Department by 32 international unions which had filed by mid-May 1960. These unions accounted for about 40 percent of union membership at that time. They reported land and buildings of \$29 million and net assets of \$321 million. These figures lead to the conclusion that labor union pension funds have larger and more important holdings of tangibles than the unions themselves. These holdings would probably be in the category of operated real estate for which a separate line item, mentioned above, has been provided, though not yet tabulated.

#### *Religious organizations*

Data on the tangible wealth of religious bodies were formerly collected by the Census Bureau. Figures on the number and value (original cost) of religious edifices and parsonages and the associated debt were collected by sect for the years 1906, 1916, 1926, and 1936, after which enumeration was discontinued.

According to the census, the value of religious edifices and parsonages at the end of 1936 was \$3.7 billion. From 1937 through 1962, \$10.5 billion worth of construction, excluding regular church schools, was put in place.

Aside from data on construction put in place, there is currently no further information available on the tangibles of religious bodies. "The Yearbook of American Churches," published by the National Council of Churches of Christ in the United States, contains a presumably exhaustive list of religious bodies. This reference volume, published annually, could serve as a register for obtaining wealth data from religious bodies.

The business enterprises of religious organizations are presumably picked up when they fall into the scope of existing censuses, or are required to file tax returns with IRS.

*Charitable organizations*

Some data on the assets of this group of charities are found in "The Foundation Directory" compiled by the Foundation Library Center. These data are gathered from existing IRS records and through direct contact with some of the foundations. In the 1964 edition of the directory, total tangibles and intangibles of these foundations, based on records available in 1963, were \$14.5 billion, at a mixture of book and market values. The 1964 edition of the directory lists 6,007 foundations of the more than 15,000 which account for virtually all foundation assets. The asset total published in the 1964 directory is 26 percent higher than that published in the 1960 edition reflecting an increase in assets, the establishment of new foundations, and an increase in the coverage of the survey.

There are no centrally available data on charitable organizations primarily supported by the general public. These charities are required, generally, to submit data to local boards which conduct the contribution drives in each area. These local boards are usually members of the United Community Funds and Councils of America to which about 1,300 United Funds and Community Councils and 400 Community Health and Welfare Councils belong. It is estimated that there are about 35,000 agencies which seek support through one or more of the 1,700 councils. The United Community Funds and Councils of America has a suggested financial form which member councils can use in obtaining financial data from agencies requesting support. This form has separate line items for the following tangibles: Land, buildings, equipment, inventories, and miscellaneous.

A recent estimate by the National Conference of Christians and Jews put total assets—tangibles and intangibles—of charitable institutions, including churches, at \$53 billion. About half of this seems to be accounted for by the tangibles of religious bodies (1936 stock plus subsequent additions through 1962) and the total assets of foundations covered in "The Foundation Directory."

*Miscellaneous nonprofit organizations not elsewhere classified*

There are no data available for these organizations. In 1935 a census of "Nonprofit Organizations, Office Buildings and Miscellaneous" was part of the census of business. Among other sectors, the census covered trade and professional organizations, civic organizations, war veterans organizations, trade unions, golf and country clubs, and welfare and relief organizations. While no wealth data were collected, the Census Bureau obtained employment and payroll figures for 43,330 establishments and published them by State. These data were regarded as incomplete since there was no way to enforce responses. Subsequent to 1935 this part of the census of business was discontinued.

### III. EVALUATION OF GROSS BOOK VALUE AND SUPPLEMENTARY DATA REQUIRED TO MAKE WEALTH ESTIMATES

#### GROSS BOOK VALUE DATA

The most important obstacle to the preparation of wealth estimates for the services sector is the lack of gross book value data for many subsectors. For the profitmaking subsector, gross book value figures

are currently lacking for about half of partnerships, which accounted for about 29 percent of total receipts in the 1959-60 tax year, and all of sole proprietorships. Coverage of the partnership sector can be increased if the IRS makes a special effort, in the year for which wealth estimates are to be made, to enforce the requirement that partnerships file information returns. For sole proprietors, gross book value could be obtained from a tabulation of the depreciation schedule (C-1) in the individual tax return. Land would have to be estimated, but is probably a relatively small item. Inventory data are available for all legal forms of organization.

In the nonprofit sector there are serious gaps in the gross book value data. These data are available and sufficient for higher educational institutions, hospitals, and labor unions and union pension and welfare funds. No organized bodies of data are available for nonpublic elementary and secondary schools, junior colleges, and charitable institutions, but directories and registers exist where the data, if reported, may be found. In most of these cases, however, tangibles and intangibles may be mingled, and the valuation bases are not explicit.

Another approach, as yet unexplored, to data on charitable foundations may be through the IRS, which subject to explicit regulations, requires the submission of balance sheets annually by certain tax-exempt foundations. It is understood that compliance with these regulations may not be widespread. No tabulations of existing data have been made. Data for nonpublic museums, art galleries, and botanical and zoological gardens are even sketchier than those on charitable foundations and private schools below the college level, but seem to be improving. The American Museum Association has expanded its collection of such data and has a register; IRS may be another avenue of approach. No data are available for religious bodies or miscellaneous nonprofit membership organizations, although some types of organizations in the latter group are required to file tax returns.

#### DETAIL ON GROSS BOOK VALUE DATA

The three basic types of detail desirable in the preparation of wealth estimates are detail by industry, by geographic area and by asset type.

Geographic and industry detail are a natural outgrowth of census and IRS data collection efforts. The Census Bureau publishes data by county and SMSA, in as much as four-digit detail for some industries. Data collection on an establishment basis facilitates more accurate industry detail. IRS, which covers relevant industries in both SIC 7 and 8, presents three-digit and some four-digit detail on an industry-of-companies (defined for tax reporting purposes) basis.

Because most firms in the profitmaking service sector are single-establishment companies—95.2 percent of those covered by census are in this category—IRS data distributed by industry should not be too different from those collected by census. For the same reason, IRS could provide regional data, for as many as 63 IRS districts with which tax forms are filed. With respect to both bodies of data there is one problem in industrial classification which merits mention. Some service trade establishments have a substantial portion of their tan-

gibles devoted to associated retailing operations. There is no inexpensive way of dealing with this problem and the current method, classification of establishments by primary activity, seems most feasible. Data on retail sales by major lines, collected in the 1963 Census of Business, may be of some help in eliminating this problem.

In the nonprofit area, industry detail, sufficient to be meaningful, would not be difficult to obtain as a byproduct of the collection of gross book value data. Any census would have to approach each of the major nonprofit areas separately, so industry detail would be given. On geographic detail, less information would be available, unless the establishment was the basic data unit. For schools, hospitals, libraries, museums, art galleries, botanical and zoological gardens, and most charitable foundations, the tangibles are probably located at the headquarters of the organization and there would be no problem in getting regional detail. But for organizations with establishments nationwide such as religious bodies; labor unions; certain charitable organizations such as the Salvation Army; civic, social, and fraternal organizations; and business, professional, and political membership organizations, this would not be true.

Asset-type detail is generally lacking. Where detail is available it is rarely greater than a breakdown into land, buildings and structures, machinery and equipment, and inventories. For institutions of higher education the detail is greater, with subtotals for different types of buildings and machinery and equipment. In the profitmaking industries, IRS balance sheets, when available, contain land, inventories, and depreciable assets. For proprietorships, the C-1 schedules could be analyzed to obtain greater detail for depreciable assets. For labor unions, the tangibles are broken down into land, buildings, automotive equipment, office furniture and equipment, and other fixed assets. For hospitals there is some physical volume data, such as number of beds, to augment the aggregate gross book value totals.

In summary, detail is much more readily available for some sectors than for others. The presentation of wealth estimates in detail increases the effort required by the responsible agency. Each additional item of detail compounds, multiplicatively, the number of data cells to be filled. In addition, where the information required to revalue gross book data (discussed below) is to be obtained on a sample basis, the sample size must be larger.

#### SUPPLEMENTARY DATA REQUIRED TO MAKE WEALTH ESTIMATES

Gross book value data have limited usefulness for analytical purposes because they reflect the influences of changes in the acquisition cost of tangible capital over time. For this reason many types of intertemporal or cross-sectional analyses of series on wealth cannot be accomplished. Adjustments for price changes in the underlying data are necessary in order to broaden the uses of the estimates. These adjustments can be made by applying appropriate price indexes to the gross book value data, arrayed by groups of year of acquisition. These price indexes can be based on any year, but if they are based on the most current year, the resulting estimates are those of replacement cost, and thus, are useful for additional analytical purposes.

To make these estimates, age distributions of tangible assets by type, and relevant price indexes for each type, are required. The age distribution, ideally, should be by year, but years could be grouped if other considerations so dictated. Asset-type classes should be narrow enough to permit the use of price indexes which are not overly gross. On the other hand, adequate price indexes would be required for each asset class.

As noted above, asset-type detail for the service industries is generally lacking. Sufficient age distributions are presently available only for higher educational institutions. The availability of price indexes cannot be evaluated without prior knowledge of the asset-type classes important in the service industries. The general topic of price indexes is treated in the Wealth Inventory Planning Study staff report. The lack of suitable construction cost price indexes for structures, and the unavailability of price indexes for certain types of capital equipment which are infrequently purchased throughout a year, are two major deficiencies which should be mentioned, however.

#### LEASED ASSETS

For many analytical purposes, the tangible capital used, rather than owned, by an industry is the relevant variable. The extent to which the two tangible capital measures differ varies from industry to industry. There are very few data on the extent of leasing in the services industry. Those which are available relate to the profitmaking services industries and are described in section II. Some additional insight into the extent of leasing can be gained by an analysis based on rent data reported to the IRS. Rental payments made by sole proprietorships, active partnerships, and active corporations, for their fiscal years ending between July 1, 1959, and June 30, 1960, totaled \$2.1 billion. If these are capitalized at 10 percent, the resulting figure—an estimate of the gross book value of leased capital—is \$21 billion. This is 70 percent of the estimated gross book value of land and fixed reproducible assets owned by the sector, as shown in table I. (The rental payment figure of \$2.1 billion does not include rental payments which respondents may have combined with "cost of goods sold" for income tax purposes.) The 70-percent figure compares with 13 percent for the manufacturing sector as of the end of 1957, computed in a similar way.

The seemingly substantial amount of assets leased by firms in the services industries does not seem high, intuitively. The sector is characterized by small-scale operations with limited access to capital, relative to its cost. Leasing is appealing under such conditions. The operations of many establishments, such as those of professional people, are too small to fill a structure of usual size. Accordingly, the rental of space in large office buildings is widespread.

Despite its importance, there is little information on which estimates of asset leasing can be made. Ideally, such data should consist of figures on rents paid, obtained from lessees, and figures on the gross book value of leased assets and the rent received for leasing them, obtained from lessors. These data should be arrayed by asset type. The rents received and gross book value data can be used to compute a capitalization rate for each asset type, and then this rate

can be applied to the rental payments. As currently collected, the IRS data on rents paid and received are inadequate for meaningful estimates of leased assets. The main deficiencies are (1) the incompleteness of the figures because some rental payments are combined in cost of goods sold, and some receipts, in total business receipts; and (2) rental data contain, in varying degrees, amounts paid for such items as maintenance of the leased property.

#### IV. RECOMMENDATIONS

The group urges that wealth estimates—at depreciated replacement cost or current market prices—be developed for the services sector as defined above. Because of the heterogeneity of the composition of the sector and the paucity of data in many subsectors, the group is aware of the ambitiousness of the goal. Accordingly, it has set priorities, which reflect its assessment of the relative importance of the various aspects of wealth estimates.

Top priority should be given to the preparation of a national total, broken down into two sectors—profit and nonprofit, by use and ownership. The second priority is for a breakdown of these two subtotals into asset-type categories which would show land, structures, equipment, and inventories separately. The third ranking objective is detail by industry to the greatest extent possible while maintaining the separation between the profit and nonprofit sectors. This detail could also yield breakdowns by legal form of organization at little or no additional cost. Fourth in importance is detail by region on a four- or nine-region basis. Fifth, and finally, a breakdown by asset size would be desirable for certain service industries.

In order to achieve the objectives set out in the first priority—national wealth totals, at replacement cost, gross and net of depreciation or current market—it will be necessary to obtain comprehensive gross book value data, price indexes covering the broad types of reproducible tangible assets found in the services industries, and information on the average ages and remaining useful lives of these tangibles. To obtain these required data, the following recommendations are made:

1. For those industries for which IRS collects data, the IRS data should be used where applicable to the greatest extent possible. A determination should be made of the extent to which IRS data can be made more useful in preparing wealth estimates by (a) tabulating data already collected (viz, schedule C-1 for sole proprietors), (b) obtaining balance sheets from a larger number of partnerships and nonprofit organizations, and (c) adding additional questions to tax forms. An alternative approach, to be explored if the former does not prove feasible, is to broaden the scope of the census of business to include profit-making industries in the SIC 8 classification and to add an inquiry on gross book value to the census questionnaire. Land and inventory figures, small relatively, could be estimated based on balance sheets filed with the IRS.

2. The Office of Education should obtain gross book value data on fixed assets from private elementary and secondary schools and junior colleges, thus extending the scope of the comprehensive data it has collected on higher educational institutions.

3. The American Association of Museums should be encouraged to extend the scope of its previous survey to obtain gross book value data on fixed assets for museums, art galleries, and botanical and zoological gardens.

4. The Census Bureau should resume its census of religious bodies in order to obtain gross book value data on their fixed assets but, for the purposes of wealth estimation, it is not necessary to tabulate or publish these data by religious sect, as was done previously.

5. There are two possible vehicles for obtaining gross book value data on the tangibles of charitable foundations—either (a) enforce the legislation requiring tax-exempt organizations to file annual balance sheets with IRS or, (b) obtain the cooperation of such organizations in submitting their balance sheets to the Foundation Library Center in conjunction with its publication of the Foundation Directory.

6. Obtain the assistance of the United Community Funds and Councils of America in obtaining balance sheets from charities supported by the general public through local campaign organizations which currently require such data of charities wishing to become beneficiaries of local drives.

7. The Census Bureau should obtain a register of nonprofit organizations not covered above, perhaps through social security employer identification numbers, and collect gross book values for the fixed assets of these organizations.

8. It is recommended that the Census Bureau have general overall responsibility in the planning and coordination of the efforts put forth by the public and nonpublic organizations just mentioned.

9. Land and inventory estimates should be made for the private, nonprofit sector, using available information to make extrapolations.

10. Data on the asset-type composition, for broad classes, of the reproducible tangibles of major sectors of the services industry, along with average ages and useful lives of these asset types, should be obtained on a small sample basis, for use in converting the gross book value data to gross and depreciated replacement cost estimates, as well as for their intrinsic interest.

Once the gross book value data have been collected, the next step is to recast the estimates for reproducible tangibles to replacement cost, both gross and net of depreciation, and to revalue land and inventories in accordance with the recommendations contained in the Wealth Inventory Planning Study staff report.

The revaluation of reproducible tangibles requires data on asset ages, prices and the depreciation curves which are appropriate. Since the estimates given top priority are broad aggregates, gross book value data by age (using appropriate intervals of years) for structures and facilities, and machinery and equipment, should be obtained from a sample of organizations in each major sector. These data can then be reflated using appropriate, though rather aggregative price indexes, to a gross replacement cost basis.

Through the use of data obtained in other sectors of the economy, depreciation curves could be constructed for both the structures and

facilities and machinery and equipment classes. With these curves and the age distribution collected on a sample basis, estimates of depreciation could be made, and depreciated replacement cost stock estimates, prepared. These data could then be added to the revalued land and inventory data to arrive at national totals at current values, shown separately for both the profit and nonprofit sectors, on both an ownership and use basis.

Second in order of priority in the opinion of the working group, is to firm up the asset-type detail. This would involve obtaining from respondents, on a census basis, a breakdown of their gross book value data into land, structures, equipment, and inventories. This step should improve the reliability of the underlying asset-type classes, data on which were to be collected on a sample basis only in preparing the estimates given first priority. These data would facilitate the collection of greater asset-type detail—perhaps machinery, office equipment, transportation equipment, office buildings, plants, etc.—on a sample basis.

Third priority is given to obtaining the greatest possible industry detail. The following detail is suggested as being useful for analytical purposes:

- (1) Three digit SIC detail for the profitmaking services sector;
- (2) Hospitals, broken down into voluntary and proprietary;
- (3) Four-digit SIC detail for educational services;
- (4) Three-digit SIC detail for museums, art galleries, botanical and zoological gardens;
- (5) Labor unions and similar labor organizations broken down into the unions themselves, and their pension funds;
- (6) Religious organizations, excluding their schools which will be shown inseparably as part of each relevant four-digit break under (3) above; and excluding their business enterprises which fall into the scope of existing business censuses.
- (7) Charitable organizations, broken down into those supported by certain individuals, i.e., foundations, and those supported by the general public;
- (8) Miscellaneous nonprofit membership organizations, not elsewhere classified, broken down into (a) business, (b) professional, and (c) political membership organizations, (d) civic, social and fraternal organizations, (e) organization hotels and lodging houses on a membership basis, (f) golf and country clubs with closed memberships and (g) nonprofit membership organizations, not elsewhere classified.

The presentation of wealth data in this detail presents no problem from the point of view of collecting gross book value data, since presumably each respondent could designate the appropriate industry. The agency preparing the wealth estimates would have the added task of coding and processing more data and, probably, would have to refine the reported classifications. The size of samples used to obtain asset-age data would have to be increased. An outgrowth of industry detail would be a breakdown by legal form of organization, which could be obtained at little additional cost.

Fourth priority is given to regional detail on either a four or nine region basis, depending on which is more feasible. Regional detail



may prove to be readily obtainable in some service industries which are characterized by single-establishment firms or organizations. In addition, it may prove feasible to impute greater regional detail for certain industries, for which finer breakdowns of other data, such as receipts, are obtainable from existing censuses.

Fifth, for some industries, it would be useful to have wealth data arrayed by asset-size classes. Preparation of these estimates would entail additional work in data processing, though not necessarily in data collection.

A final recommendation relates to leased assets. Figures on leased assets are necessary for analytical purposes requiring data on capital used. While the task of obtaining wealth estimates on an industry-of-use, as well as an industry-of-ownership, basis is great, some estimates of the former are required because of their importance in this sector. Pilot studies should be undertaken to assess, within the services industries, the relative importance of asset leasing in the various subsectors. Where important, leased assets should be estimated. Provision should be made to obtain the data required for these estimates—rents received and gross book value of leased assets, from lessors, and rents paid, from lessees, by appropriate asset-type breaks—on a sample basis, if necessary. The recommendation to construct estimates of leased assets applies to all the priorities discussed above.

#### ANNEX A

##### THE VALUATION OF MANMADE NONREPRODUCIBLE WEALTH

In some organizations within the services sector, notably museums and art galleries, manmade nonreproducible tangibles—art objects—comprise a greater proportion of total wealth than other tangibles. While art objects are owned by the household, public and business sectors, these holdings are not important relative to the total wealth of these sectors. Because of the significant allocation of resources by museums and art galleries and their patrons to obtain such wealth, the Working Group fell heir to the task of giving special attention to these assets. However, the Working Group as a whole did not feel qualified to pass judgment on the feasibility and merit of taking an inventory of art in monetary terms. Accordingly, it passed the responsibility for an exploratory investigation to Mrs. Carolyn Wells, member of the Working Group and assistant for special projects, American Association of Museums, and to John Kendrick and Joel Popkin of the Wealth Study staff. It was understood that the findings of the investigation, whatever they might be, would be annexed to the report of the Working Group.

The exhibits which appear in this annex represent the bulk of work that was done in eliciting information about the feasibility of such an inventory. A luncheon meeting was held to get the views of some individuals in the Washington area familiar with art and museum administration. The minutes of this meeting, prepared by Mrs. Wells, appear in exhibit A.

With the cooperation of Mrs. Wells and the American Association of Museums, a questionnaire on the feasibility of an inventory of art, drawn up by Messrs. Kendrick and Popkin, was sent to 35 museums. A copy of the questionnaire, together with a tabulation of the responses which were received from a total of 20, appears in exhibit B.

Mr. Richard H. Rush, noted as author of "Art as an Investment," was contacted and asked to comment on the possibilities of an inventory. His statement appears in exhibit C.

In addition, a general discussion of the problems, conceptual and practical, of valuing manmade nonreproducible assets is found in chapter VII of the wealth inventory staff report.

## EXHIBIT A

## REPORT TO THE WORKING GROUP ON WEALTH IN THE SERVICE INDUSTRIES ON A SPECIAL MEETING FOR THE MUSEUM FIELD

A luncheon meeting was held at the National Gallery of Art on November 12 to discuss the problems and possibilities of making a wealth inventory in the museum field. In addition to the staff director of the Wealth Inventory Planning Study, Professor Kendrick, and the secretary, Mr. Joel Popkin, the participants were: Miss Kathryn Bloom, Cultural Affairs Branch of the Office of Education; Carter Brown, assistant to the Director, National Gallery of Art; Mr. Paul Oehser, Editorial and Publications Division, Smithsonian Institution; Mr. Donelson Hoopes, curator, Corcoran Gallery of Art; and Mrs. Wells, American Association of Museums.

The basic problem in attempting to evaluate museum collections was immediately recognized: should cultural values be translated into monetary terms? The general reaction was that they should *not* be, because especially in the art field we are dealing with an area which cannot be reduced to this denominator. It was pointed out that this would apply also to churches and libraries. Museum collections consist mainly of *irreplaceables* whose value cannot be expressed in dollars.

Upon further discussion, it was, however, agreed that it would not be wise to leave museums entirely out of a national wealth inventory. Buildings and equipment would naturally be included; but if art, science, and history collections form a part of the Nation's wealth, then the information as to the monetary value of such collections should be accessible to the American public.

Assuming then that it might be desirable to evaluate museum collections, would it be possible? The following points were brought up:

1. Insurance policies would not offer a method of determining values. Museums generally do not insure their collections except when traveling; and seldom does the insurance coverage reflect to any degree the actual value.

2. Market values in art are constantly changing. If art museums could give out the cost to them of objects which were purchased in former years, the market price would have to be marked up tremendously over the cost because of the current situation; the great works of art in Europe can no longer be exported, for instance.

Auction prices by their very nature may be misleading and may not take into account questions of attribution and condition; on the other hand, it could be assumed that the bidders are knowledgeable in the field and that the final price would therefore give some indication of current value.

3. It would be difficult to establish a *basis* for evaluation in the art field. For example, the National Gallery recently purchased a Fragonard at public auction for \$875,000. This would not mean that a museum having a Fragonard of the same size could say that its painting was also worth \$875,000.

4. Many museums might consider the value of their collections confidential information. However, the American Association of Museums has in the past collected confidential information and used it only for statistical tabulations. In this case also all data would be kept confidential. The service industries working group had previously agreed not to go into regional detail.

There are some museums (i.e., the Denver Art Museum, and the North Carolina Museum of Art) which have published valuations of their collections in annual reports. A larger number of museums publish figures for the annual expenditure for new acquisitions. This would, of course, represent only a percentage of the total value of the collection, but might serve as a starting point.

If it were both desirable and possible to collect information from museums for a national wealth inventory, how might this be done, and what purpose would such information serve?

1. It is not known at this point how many museums are willing, or if willing, are equipped, to estimate the current value of their collections. The first step would be to get some indication of this, and then to collect the data through a brief questionnaire.

2. It was felt by most of the participants that the figures collected would not be meaningful, in view of the *uniqueness* of the items in museum collections, and their irreplaceable nature. Two years ago, for instance, the National Trust for Historic Preservation dropped value reporting on the grounds that there can be no valuation where there is no market.

However, it was agreed that other museums should be asked to give opinions on the desirability, feasibility, and significance of a wealth inventory in their field.

To sum up the views of the participants :

1. No monetary evaluation of museum collections should be allowed to obscure the cultural significance of museums.

2. The need for public support of the cultural and educational activities of museums must not be deemphasized by the publication of the value of museum collections.

3. Knowledge of the value of museum collections might, on the other hand, stimulate donations for the custodial care, preservation, and display of such collections.

4. Information on the wealth of the Nation's museums might have some public relations benefits.

5. Such information might serve to illustrate the increase in the cultural resources of our country. Deficiencies in such resources in certain areas might also be determined.

It was decided that available information in published annual reports would be checked ; that an inquiry would be made to find out how such published figures had been arrived at ; and that a small number of museums would be sampled for their reaction to the Wealth Inventory Study in terms of their willingness to assist in it and of the availability of the necessary data.

CAROLYN H. WELLS,  
*Assistant for Special Projects,*  
*American Association of Museums.*

NOVEMBER 14, 1963.

EXHIBIT B

[Questionnaire sent to 35 museums : tabulation of 20 responses received]

AMERICAN ASSOCIATION OF MUSEUMS, WASHINGTON, D.C.

DECEMBER 13, 1963.

DEAR ———: Under a grant from the Ford Foundation, the Wealth Inventory Planning Study of the George Washington University is studying the problems and possibilities of a national benchmark inventory of wealth, to be taken by 1970.

The Wealth Study staff seeks guidance as to whether to include, in addition to land, structures, and equipment, the nonreproducible assets represented by the collections of museums (as well as of individuals). This brief questionnaire is being sent to several dozen museums to test the feasibility of getting meaningful cost or value estimates of the collections, and the desirability of doing so.

We shall appreciate very much your cooperation in helping the Wealth Study come to a determination in this area.

A. Would you be able to report the following from present records or estimates ; or could you, without undue burden, prepare at least rough estimates of the following :

	Yes	No
1. Cost of additions to collection during the past year.....	13	4
2. Approximate market value of items donated during the past year.....	10	7
3. Proceeds from sales of works of art during the current year.....	4	10
4. Historical cost of all purchased items in current collection.....	4	11
5. Current or recent market value of purchased items.....	6	11
6. Approximate market value of donated items.....	4	13
7. In rough terms, the percentage of the total value of collections accounted for by purchased items.....	5	11

B. Would you favor attempting a one-time national survey of the value of museum collections (only aggregates to be published, on a regional and national basis)? Yes, 7; No, 8.

C. General or specific comments on the proposed survey (feasibility and desirability):

Please return to the AAM, attention Mrs. Wells.

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EXHIBIT C

STATEMENT OF RICHARD H. RUSH, RYE, N.Y.

First, I would like to comment on some of the criticisms which might be leveled at the taking of an inventory of works of art in monetary terms.

1. It is true that in a sense art is above money. Art inspires and represents beauty whereas money is considered by the art intelligentsia to be something of a rather low level.

2. Art is the product of a group of people who have had to ask for money in return for the production of the art.

3. If these works of art had money value when the artist produced them in order to exist, they have had value since that time—either more or less—and that value is all we are talking about.

Now here are my general comments:

A. Almost every item of art in every museum at one time or another had a price tag on it. The National Gallery of Art collection, for example, consists primarily of the Mellon Collection, the Kress Collection, the Widener Collection, and the Chester Dale Collection. I published most of Mellon's purchase prices of the items in the gallery. The Kress figures are available, and I think the Widener and Dale figures can be unearthed.

B. Value of these items can be brought up to date by a competent valuer; this same procedure can be followed for all museums in the United States.

C. Nobody is talking about flooding the market with the contents of any one museum or all of them. We are talking about an orderly offering of the art objects, and if they are marketed in this way the price can be forecast fairly well and thus recorded for your survey.

D. This procedure would be far more difficult in Europe where the art is much better and much rarer than in the United States. How do you value the Winged Victory, or Michelangelo's Pieta or Michelangelo's Sistine Chapel ceiling? These things are unique. But we have nothing to compare with these items in this country. Let us say that the National Gallery has 550 paintings in all. The Louvre has 3,500 hanging and 25,000 in all. Our job here is not so hard.

E. The valuation should be done independently, using published reports and photos of the paintings in each gallery in this country. The same will have to be done with sculpture and antiquities, etc., and where these are not traded on the market the job will be much harder. I am talking about what I am familiar with—paintings. But even here a fairly good job can be done with not much error.

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APPENDIX II: PART O

REPORT OF THE WORKING GROUP ON NONFARM  
BUSINESS FINANCIAL CLAIMS

Prepared by ELEANOR J. STOCKWELL

MEMBERSHIP OF THE WORKING GROUP ON NONFARM BUSINESS  
FINANCIAL CLAIMS

Norman Adler, Statistics Division, Internal Revenue Service

John A. Gorman, Office of Business Economics, Department of Commerce

Robert E. Lipsey, National Bureau of Economic Research

Morris Mendelson, Wharton School of Finance, University of Pennsylvania

Vito Natrella, Office of Statistical Studies, Securities and Exchange Commission

Sally S. Ronk, Economics Department, Bankers Trust Co.

R. Duane Saunders, Office of Debt Analysis, Department of the Treasury

Eleanor J. Stockwell (secretary), Division of Research and Statistics,  
Board of Governors, Federal Reserve System

## PREFACE

The Working Group on Nonfarm Business Financial Claims held four meetings: on August 7, October 4 and 25, and November 22, 1963. In addition to the members of the working group, those attending one or more meetings included Joel Popkin, John W. Kendrick, Robert M. Fisher and Robert L. Sammons.

All members of the working group participated actively in the discussions and reviewed a preliminary draft of this report. In addition, Mr. Gorman and Mr. Natrella each prepared special materials which greatly facilitated the work of the group.

The final report, however, is the responsibility of the secretary, though she has attempted to reflect the consensus of the group, especially with respect to recommendations.

ELEANOR J. STOCKWELL.

# NONFARM BUSINESS FINANCIAL CLAIMS

## I. INTRODUCTION

The Working Group on Financial Claims was formed to consider the kinds of data on financial claims of business enterprises that it would be desirable and feasible to collect in connection with a comprehensive inventory of national wealth. The economic sector assigned to the working group comprised all businesses other than farms and Government enterprises. Thus it included unincorporated businesses as well as corporations, financial institutions as well as non-financial businesses, nonprofit organizations as well as businesses organized to make a profit.

The focus of the working group's discussions reflected to a large extent, of course, the points of view of the particular people who were members of the group. In general, the members were more concerned with the composition of total claims of and on the business sector, than with the characteristics of specific financing instruments. Also, the working group viewed a reliable inventory of business financial claims as requiring full balance sheets, obtained directly wherever possible and derived by imputation only where absolutely necessary. No consideration was given to collecting wealth data on a selective, instrument-by-instrument basis—whether by surveying major holders, or by surveying major issuers, or by surveying both groups and merging the results. The focus of the working group's approach, on the sector rather than on types of wealth and on collection of comprehensive rather than selective data, is evident in its recommendations.

## II. USES OF BENCHMARK DATA

Data on financial claims for the business universe are needed for a variety of purposes which may perhaps be grouped under three major headings: (1) Analysis of financial structure, including liquidity positions, debt burdens, rates of return; (2) measurement of financial flows, both within the business sector and between this and other sectors; and (3) evaluation, based on theoretical as well as empirical investigation of business financial behavior, of the impact of actual or proposed fiscal, monetary or legislative actions of the Government. Each of these requires statistical information that is as reliable, as uniform in concept, and as comprehensive in coverage as it is practicable to obtain with available resources of time and money.

An impressive amount of information on business financial wealth is already available in the statistics compiled regularly by a variety of Government departments, regulatory bodies, and private organizations. A number of serious gaps exist, however. Some of these gaps are present in both benchmark and current data; for example, no strong data on financial wealth are available, on either a benchmark or current basis, for certain sectors of the business universe or for certain



new types of wealth of covered sectors. Some gaps involve inconsistencies in concept, or in presentation, between benchmark and current statistics; major pieces of information, available on a current basis, are of limited usefulness for extrapolating purposes because no benchmarks are available for these particular pieces. Some of the most troublesome gaps relate solely to the coverage and quality of the statistics that are available on a current basis.

A systematic inventory of business financial wealth could fill present gaps in our benchmark statistics, although it must be recognized that collection of data in some areas might present insurmountable difficulties. Such an inventory could also provide a better basis than now exists for using less comprehensive current series to update benchmarks. Finally, one of the most significant contributions of the kind of benchmark statistics envisaged in this report could be to stimulate, and provide standards for, needed improvements in regular collected current statistics.

### III. REVIEW OF EXISTING DATA

The principal sources of balance sheet statistics are reviewed in this section of the report. In a later section, reference will be made to those sources that seem to be appropriate vehicles for obtaining parts of any systematic inventory of financial wealth, if arrangements can be made to expand and standardize the data they collect.

#### *All corporations—tax return data*

The most comprehensive body of existing data on business financial wealth is provided by the yearly tabulations of corporate balance sheets prepared by the Internal Revenue Service and published in "Statistics of Income—Corporation Income Tax Returns." A listing of the balance sheet categories on which information is to be collected for the 1963 tax year appears as exhibit A at the end of this report. Among the cross classifications of the data are distributions by industry and size of total assets. In recent years a number of new types of tabulations, such as operating and financial ratios, have been introduced. At the same time, some useful balance sheet detail formerly collected has been dropped.

Balance sheet figures shown in statistics of income are estimated from a stratified sample of unaudited returns and are for all corporations that are required to file Federal income tax returns on form 1120, or 1120-L, 1120-M, 1120-S, or 1120-F (resident only). Data are for accounting periods ended July of one year through June of the following year.

Despite continuing efforts by IRS to improve the timeliness of its reports, considerable delay is unavoidable. A large part of the delay arises because of the extended period over which corporate tax returns may be filed; in the extreme case—a corporation with a fiscal year ended June 30, and a 6-month extension on filing—a tax return for the 1960 income year would not have been available for processing until the spring of 1962. In addition, substantial processing of the data is required. As a result, balance sheet tabulations for the 1960 income tax year (accounting periods ended July 1960 through June 1961) were not published until mid-1963.

*Manufacturing corporations—FTC-SEC quarterly data*

More up-to-date balance sheet information is available, for manufacturing corporations only, in the "Quarterly Financial Report for Manufacturing Corporations," prepared jointly by the Federal Trade Commission and the Securities and Exchange Commission. A listing of the balance sheet categories shown in the report is presented in exhibit B.

Balance sheet figures in the quarterly financial report are universe estimates based on a stratified sample of about 11,000 manufacturing companies, drawn in part from income tax returns and in part from applications for a Federal social security employer's identification number. One-eighth of the smallest corporations in the sample are replaced each quarter.

This series differs in several respects from the Statistics of Income tabulations—the balance sheet categories are not quite the same, reporting by corporate entities is on a more highly consolidated basis, and accounting yearends are not tabulated together as in S.O.I. but are included in the appropriate calendar year quarter. Nevertheless, the FTC-SEC series has proved to be a valuable tool for extrapolating Statistics of Income data for the corporate manufacturing sector.

*Nonfinancial corporations—SEC quarterly working capital series*

Up-to-date statistics on the short-term portion of corporate balance sheets are available from the Securities and Exchange Commission's quarterly series on "Current Assets and Liabilities of U.S. Corporations." The items shown are: total current assets, divided into cash (on hand and in banks), U.S. Government securities, inventories, accounts receivable from the U.S. Government, other notes and accounts receivable, and other current assets; total current liabilities, divided into advances and prepayments from the U.S. Government, other notes and accounts payable, Federal income tax liabilities, and other current liabilities; and net working capital.

The series covers all corporations other than banks, insurance companies, and savings and loan associations. While figures are published and generally available only for all industries combined, these are summations of separate estimates for each of 13 major industrial groups. Yearend figures for each industry are benchmarked to the detailed IRS tabulations from Federal income tax returns, and substantial revisions are sometimes required when IRS data become available. Even for benchmark dates, some items are partly estimated because the classification of accounts desired for the working capital series is not directly available from IRS tabulations.

Extrapolations for post-IRS years (currently post-1961) are based on: the FTC-SEC quarterly financial report for manufacturing; Interstate Commerce Commission data for railroads; and, for all other industries, figures supplied by those registered companies that voluntarily file quarterly reports with the SEC. The agency has had considerable success in persuading a very large proportion of all registrants to file quarterly working capital statements, but in some industries the total number of registrants is very small. In agriculture, construction, wholesale and retail trade, service and finance—industries that together account for three-eighths of total corporate working capital—less than one-tenth of 1 percent of all corporations

are registered companies; these industries contribute heavily to the benchmark revisions in the aggregate estimates.

*Partnerships—tax return data*

While partnerships are not taxed as entities, each partnership is required to file an information return form 1065. A balance sheet is included with the form. In odd-numbered years balance sheet aggregates are prepared, and published in "U.S. Business Tax Returns," for those partnerships filing this information. Tabulations are based on a stratified sample, they are shown by industry and by size of firm, and the categories of assets and liabilities are similar to those for corporations.

*All business—flow-of-funds series*

The Federal Reserve, as part of its flow-of-funds statistics, estimates both quarterly financial flows and end-of-year financial asset and liability levels for each sector. Estimates are derived from an enormous number and variety of data sources.

*Other sources for specific industries*

In addition to the the statistics described above, a large number of public and private organizations collect and/or tabulate data on business financial wealth, in most cases for some one type of enterprise—e.g., banks, railroads, pension funds. The kinds of information available vary greatly, since they reflect both the purpose for which the data are collected and the predominant activity of the type of enterprise covered. The variation is so great that it does not seem practical to describe these sources in detail, or even to list all of them.

The following listing is intended to cover most of the principal sources of specialized information. The listing includes only statistics that encompass the entire balance sheet, however broadly, and that are available on a regularly recurring basis. Thus it excludes regular series on specific types of wealth, such as the consumer credit and mortgage debt statistics, and one-time or occasional studies.

*Banks.*—Data are collected and tabulated by the various supervisory agencies. Detailed statistics on loans, investments, reserves, and other balance sheet accounts are available for all banks for call dates. Less-detailed information is collected for weekly reporting Federal Reserve member banks, and is estimated by the Federal Reserve for all commercial banks. Also, for all mutual savings banks, monthly estimates are published by the National Association of Mutual Savings Banks.

*Insurance companies.*—Detailed annual statements are filed by individual companies with State insurance commissioners. (Copies of these statements are required to be submitted with the IRS Forms 1120-L and 1120-M filed by these companies.) Tabulations, from company reports and other sources, are prepared for life insurance companies by the Institute of Life Insurance and for fire and casualty insurance companies by Best & Co.

*Savings and loan associations.*—Estimates of major categories of assets and liabilities, based on monthly reports of insured associations and annual reports of noninsured associations, are prepared and published by the Federal Home Bank Board.

*Investment companies.*—Data for open-end companies are compiled by the Investment Company Institute from reports of members.

*Pension funds.*—Every pension plan that covers more than 25 employees is required to file an annual financial statement with the Department of Labor. However, the only published aggregates presently available on a regular basis come from the Securities and Exchange Commission's annual survey of noninsured corporate pension funds.

*Labor organizations.*—These also make regular financial reports to the Department of Labor. Published figures are for the total liabilities and for very broad categories of assets.

*College endowment funds.*—Data are available every fifth year (including 1963) from a survey conducted by the Office of Education, U.S. Department of Health, Education, and Welfare.

*Credit unions.*—Data for major balance sheet categories are available from the U.S. Department of Health, Education, and Welfare. The Department also publishes monthly figures on total assets of credit unions.

*Finance companies.*—The Federal Reserve compiles annual balance sheet figures for about 100 sales and consumer finance companies. The data are obtained from stockholders' reports and other secondary sources. Similar compilations for about 300 large companies in other selected industries, which the Federal Reserve formerly prepared, were discontinued some years ago.

*Hospitals.*—The American Hospital Association publishes annual data on the total assets and plant of nonprofit and proprietary hospitals.

#### IV. NEEDED IMPROVEMENTS IN EXISTING DATA

Presently available information on business financial wealth, voluminous as it may seem to be, is incomplete or otherwise inadequate in a number of respects. The most important improvements needed on a benchmark basis are those that would provide: (1) more comprehensive coverage of the business sector, particularly of unincorporated concerns in all lines of activity and of corporations in a number of finance and service industries; (2) more detailed classifications of certain items of financial wealth, primarily to take account of postwar shifts in the structure of financial claims; (3) more comprehensive and more uniform reporting of business financing, on a from-whom-to-whom basis and with systematic term or maturity breakdowns; and (4) recasting of the industrial detail presently available, to segregate groups that have large holdings of financial wealth, or engage in unique financing activities, or are identifiable components of regularly collected series.

##### COVERAGE OF THE BUSINESS SECTOR

No benchmark data on financial claims are presently available for certain parts of the business sector; in some cases no vehicle currently exists for collecting such data.

##### *Unincorporated concerns*

Figures on the financial assets, debts and net worth of unincorporated concerns are needed for a number of purposes—to examine the financial health of small business especially with respect to the need for governmental assistance, to analyze the sensitivity of small business to fiscal or monetary policy or to cyclical fluctuations, or simply

to provide statistics on financial wealth or financial flows that cover the entire corporate and noncorporate business sector. Such data are not presently available, however. Efforts to collect them have in the past been frustrated by lack of records, reluctance to supply such records as exist, and, in the case of sole proprietorships, the difficulty of distinguishing between business accounts and the personal accounts of owners.

Less than half of all partnerships file balance sheets with IRS. These are generally the larger firms; they account for 63 percent of the net profit and 70 percent of the total receipts of all partnerships ("U.S. Business Tax Returns, 1961-62"). It is not known to what extent the financial structure of reporting firms is typical of the universe of partnerships. No balance sheet statistics are presently collected for sole proprietorships, though they comprise three-fourths of the number of all nonfarm businesses.

When noncorporate balance sheet figures are required they are estimated, in one fashion or another, from whatever available series appear to be relevant or, alternatively, balance sheet data for small corporations are used as a proxy. Without a set of benchmark statistics, there is almost no way to test the validity of the various indirect methods of deriving balance sheet data for noncorporate business.

#### *Tax-exempt organizations*

A variety of organizations, since they are tax exempt, are not required to file any version of form 1120 with IRS, and hence are not included in the balance sheet data compiled by that agency. Some of these—including farmers' cooperatives, foundations, charitable trusts, hospitals, museums, libraries, miscellaneous nonprofit membership organizations (business, professional, civic, and social), and labor unions—file returns on some version of form 990 and are supposed to submit balance sheets with the form. Balance sheet information submitted by farmers' cooperatives were compiled by IRS for 1953 and will be compiled for 1963. Also, the Foundation Library Center has compiled some wealth data for foundations filing form 990-A (which is open to public inspection), but the underlying information appears to be unsatisfactory. With these two exceptions, the balance sheet data filed with IRS by tax-exempt organizations have never been compiled nor even examined for coverage.

A few of the organizations that report to IRS, and some—such as college endowment funds and pension and welfare funds—that are not required to file returns with this agency, file regular financial reports with other agencies. However, there are some that are not at present subject to any financial reporting requirements. Among the latter are churches and other religious organizations, charitable organizations (receiving funds primarily from the general public), and fraternal organizations.

Some types of tax-exempt organizations probably hold largely tangible assets but others are believed to hold substantial amounts of financial assets. Despite the desirability of covering all types of organizations in any inventory of wealth, collection of data has in the past been discouraged by seemingly insurmountable difficulties, including identifying a significant proportion of them, assigning meaningful values to certain of their assets, and persuading them to disclose their holdings.

## CLASSIFICATION OF FINANCIAL ASSETS

Some of the present categories of business assets (and debts) are too broad to provide needed information. Certain types of assets, such as corporate holdings of non-Government short-term securities, are known to have increased greatly in importance in recent years but are still included in miscellaneous categories. Conversely, some miscellaneous categories have grown rapidly and no information is available as to what are now their principal components. For other categories, including accounts receivable and business debt instruments, needed details are not available directly but must be estimated from related series compiled for other purposes.

The following paragraphs illustrate the kinds of detail which are not now available but which, if available at least on a benchmark basis, would not only contribute to our knowledge of the composition of business financial wealth but could also greatly improve the quality of theoretical investigation, current analysis and projections of financial activity in the economy. The illustrations refer for the most part to data for nonfinancial corporations, and are not by any means a catalog of all the gaps that exist in available data on business financial wealth.

*Liquid assets*

The forms in which businesses (especially nonfinancial corporations) hold their cash-type assets have become more diverse in recent years. Thus, funds which were held almost entirely in cash and demand deposits in the late thirties, and in cash, deposits, and U.S. Government securities in the late forties, may now be held in almost any type of short-term instrument that provides the combination of liquidity and yield that a corporation desires at a given time. The flexibility with which corporate investments can be shifted from one instrument to another probably means that the management of corporate cash balances is not only sensitive to, but also influential in determining, money market developments.

But present compilations of liquid asset data from corporate balance sheets segregate only the categories of cash (including deposits) and U.S. Government securities (or, as in 1963 IRS tabulations, obligations of all governmental units). Other short-term marketable investments are included as part of the item "other current assets," though there is evidence that a few corporations include them in "notes and accounts receivable."

The unavailability of a complete counting of the cash assets of nonfinancial corporations understates their influence on money market developments, both in the long run as increasingly important suppliers of funds and in the short run as traders in money market instruments. It also introduces a downward bias to calculations of corporate liquidity. Part of the persistent decline in the conventional measure of liquidity for this sector (cash, deposits, and U.S. Government securities as a percent of total current liabilities) results from the shift of liquidity reserves into instruments that are excluded, for lack of data, from the numerator of the ratio.

*Trade credit*

One of the most striking developments in business financing practices over the postwar period has been the growth in customer financing. This is reflected in the increasing importance of notes and accounts receivable in corporate balance sheets. For nonfinancial corporations as a group, receivables outstanding have expanded about twice as much as sales over the past decade or so. They now total over \$160 billion and account for nearly half of all current assets of business corporations.

Little information is available, except indirectly, on the composition of this large aggregate of financial wealth. The amount that represents funds due from the U.S. Government is known; it is relatively small and has increased less than \$1 billion since 1953. The amount that represents credit extended to consumers is estimated from the Federal Reserve consumer credit statistics. (Several methods may be used; one that assigns to the nonfinancial corporate sector all consumer credit held by sales finance companies, consumer finance companies, and department stores, one-half of that held by other retail businesses, and one-third of service credit gives an aggregate that has increased roughly \$15 billion over the decade.) The remainder is taken to represent trade credit extended to other businesses, but there is no assurance that this residual, which has grown \$80 billion since 1952, is a valid measure of this type of credit.

A parallel situation exists with respect to the other side of the customer financing process: trade credit obtained by businesses from their suppliers, which is reported as part of "notes and accounts payable." This item has also grown rapidly and, for nonfinancial corporations, now accounts for two-thirds of total current liabilities. Little information is available on its composition, except for advances and prepayments from the U.S. Government and an estimate of the short-term bank loan component. Funds borrowed through issuance of open-market paper, as measured by the Federal Reserve series, are assumed to be included, and the residual is taken to be trade debt owed to business suppliers. Then, the difference between these two questionable residuals is taken as the measure of net trade credit extended to businesses other than nonfinancial corporations.

The foregoing steps represent a most unsatisfactory method for determining the composition of such large items as accounts receivable and accounts payable, let alone for calculating net amounts of trade credit extended from one business sector to another. With respect to the latter, there is no basis for assuming that errors in the trade receivables residual are so nearly matched, numerically, by errors in the trade payables residual as to produce a reasonably accurate net figure.

One basic difficulty is that we do not know enough about what kinds of transactions, other than the obvious ones, are typically reported as part of total receivables and total payables. A second one is that we do not know how adequately we are measuring the change in, let alone the level of, corporate holdings of consumer credit. Third, there is no way to measure the influence on the figures of "float" (that part of net trade receivables that arises because a given trade credit transaction is on the books longer as a receivable than as a payable). If good benchmark data were available, for *both* corporate and noncorpo-

rate business, on the gross amount (i.e., before deducting loss and other valuation reserves) of trade credit extended to other businesses and on the amount of trade debt owed to other businesses, the net figure for the entire business sector would be zero, except for float.

Ideally, a great deal of detail should be collected on receivables and payables. A distribution of receivables by maturity would provide data for assessing the liquidity content and measuring the turnover of this major financial asset. A sectoral breakdown that went beyond the broad categories of Government, households, and business (e.g., one that presented business receivables by industry and size of the supplier cross-classified by industry and size of the customer) would permit useful studies of the anatomy of trade credit as well as of the sensitivity of this important financing arrangement to economic and financial conditions. Efforts to collect this degree of detail, however, seem beyond the scope of an overall inventory of national wealth.

### *Bonds, notes, mortgages*

In view of the magnitude of business debt, the variety of forms in which it is incurred, and the shifts that have been taking place with respect to the sources from which it is obtained, a minimum presentation of business liabilities would seem to require a breakdown of total interest-bearing debt which provided some classification according to original and/or present maturity, by some classification according to type (e.g., mortgage, term loan, bond), by some classification according to lender (bank, insurance company, open market). A comparable distribution of these instruments, when they appear as assets of lenders, would cross-classify them by maturity, type, and borrower (e.g., corporation, other business, individual).

Distributions such as these are needed just to describe the complex structure of our credit and capital markets and the nature of financial claims. Analysts also need them for studies involving debt burdens within different sectors, for evaluating the liquidity of borrowers and lenders, and for estimating actual and prospective flows of funds. Many of the data cells cannot be filled, however, even on a benchmark basis, except by patchwork and heroic assumption.

Corporations filing balance sheets with form 1120 are asked for only two categories of borrowed funds: (1) Mortgages, notes, and bonds payable in less than 1 year; and (2) mortgages, notes, and bonds payable in 1 year or more. The FTC-SEC quarterly financial report (manufacturing corporations only) separates bank loans from other types of borrowing and, by also separating for each of these two categories the amount of long-term loans falling due within 1 year, permits the user of the data to classify debt according either to original or to current maturity.

Some information on business debt, by type, can be obtained or estimated from balance sheet data compiled for lenders, but neither the present coverage of lenders, nor the detail by borrower that is available, permits more than a rough approximation of some of the categories desired. For example, the only figures for mortgage debt of businesses are those, estimated from reports of lenders, for outstanding mortgage debt on multifamily, commercial, and other business-type *properties*. An arbitrary proportion of the estimated total of all mortgages on such properties is taken as the mortgage debt owed by the corporate sector.



*Foreign claims*

Presently available data cannot be used to develop statistics on business financial wealth that will exclude all foreign claims, nor alternatively that will include net foreign claims on any specified consistent basis. In almost all cases, existing aggregates of business balance sheet accounts neither segregate foreign claims nor adjust the underlying statements to a standardized treatment of such claims.

Individual corporation reports to stockholders generally indicate the basis used to account for claims in foreign subsidiaries, and sometimes segregate or footnote the amounts included for claims of the domestic parent on foreign entities other than subsidiaries. Accounting treatment in such reports varies from company to company and, within companies, from country to country. There is more consistency in reports filed with IRS since foreign subsidiaries cannot be consolidated with the income tax returns of the U.S. parent corporation, with the exception of certain Mexican and Canadian subsidiaries.

## CLASSIFICATION BY HOLDERS AND ISSUERS

A major use of data on financial wealth is to measure flows between those who supply funds and those who use them. In the process of compiling financial claim statistics on a from-whom-to-whom basis, a great many cells need to be filled—and filled with as reliable data as can be obtained. At present, too many of these cells are of necessity filled with data that are at best approximations and that may be grossly inaccurate.

The principal problem is that in so many cases the only way to develop a desired matrix is to treat holder and issuer data as interchangeable. For a particular type of wealth, some data may be available for holders, some may be available for the issuers, and the various pieces of partial data have to be transformed into a complete from-whom-to-whom matrix through a combination of simple arithmetic, arbitrary allocation, and "judgment." Thus, bank loans of unincorporated businesses are usually derived by subtracting the amount of bank loans that corporations are estimated to owe from the total business loans that banks report they hold; term loans by banks are usually estimated from data available for manufacturing corporate borrowers; time deposits held by corporations are derived from data on bank liabilities.

But holder and issuer data are not this interchangeable. More often than not, lender and borrower (holder and issuer) financial statements will record the same transaction differently. Many factors can contribute to such differences: "float"; differences in the basis of valuation; differences in the statement date; etc. Major errors can result from imputing borrower figures from lender reports (or vice versa), especially when the spread between available borrower statistics and available lender statistics is assigned to a residual, nonreporting group (like "noncorporate business" or "individuals and all other").

The existence of differences between the way data are reported by holders and by issuers is one of the reasons for needing complete balance sheets, and for attempting to collect such balance sheets for all subsectors of the business universe—with enough detail on assets and debts so that all information desired for suppliers of funds is obtained directly from them, and similarly for users of funds. The attempt can-

not be expected to be wholly successful. Some imputations will probably always be necessary, as a last resort, but their number can undoubtedly be greatly reduced.

#### CLASSIFICATION BY INDUSTRY

Classification of business concerns by industry is difficult at best, given the amount of diversification that exists, especially among larger corporations. This need not preclude the tabulation of business data by as much industrial detail as seems meaningful but it does suggest the advisability of tailoring the amount of detail provided to the kind of statistics being tabulated.

Most statistical series that present data by industrial groupings provide very little detail under the broad heading of "Finance." For most purposes other than the measurement of financial wealth, this is quite appropriate. For purposes of a financial wealth inventory, however, especially for benchmarks designed both to spell out the distribution of financial claims and to facilitate the use of bits and pieces to carry forward the benchmark data, a specialized industrial classification is needed. Conversely, some major industries that are customarily shown in considerable detail because of the size of their sales, employment, or holdings of tangible assets, are relatively unimportant and/or homogeneous with respect to their holdings of financial assets and fine industry classifications are probably not needed.

#### V. RECOMMENDATIONS OF THE WORKING GROUP

The working group was confident that an inventory of financial claims could feasibly and very usefully be collected for almost all of the nonfarm business sector. However, collection techniques and other characteristics of such an inventory would need to differ from those developed for other parts of a national wealth inventory. This means that an inventory of business financial wealth could best be taken independently of an inventory of business real wealth and also independently of an inventory of financial wealth of other sectors.

The group recognized two major exceptions to this generalization. These will be noted at the start, since they were in a sense set apart and the bulk of the group's recommendations relate less directly to them than to the rest of the sector.

The working group tried to be as specific as possible in formulaing its recommendations. At the same time, the group was very conscious throughout its discussions of the major shifts in business borrowing and investing practices, and therefore in the composition of business financial wealth, that have taken place over the last decade. The group's recommendations reflect its views as to the kinds of information that it would be most meaningful to collect as of now. In all probability, however, some changes in the detailed recommendations will have become appropriate by 5 years from now.

#### SPECIAL HANDLING OF TWO SUBSECTORS

For sole proprietorships, and for certain tax-exempt organizations in the service division, the working group recommended that an inventory of financial claims be taken in conjunction with other parts of

a national wealth inventory, rather than independently of the rest of the inventory.

This recommendation was made for what the group considered compelling practical considerations. It did not reflect any downgrading of the importance of these two subsectors. Quite the contrary, in fact. The group believed that considerable effort should be made to develop wealth data for each of them. At present, because of the absence of such data, they are generally included as part of a complex of residuals, errors, and omissions.

#### *Sole proprietorships*

One of the more overwhelming problems involved in collecting financial wealth data for sole proprietorships is to distinguish between the business and the personal accounts of the owners of such businesses. The working group concluded that the most feasible way to separate the personal and business components of financial wealth of sole proprietorships would be to count all assets and debts as personal except for those that are clearly identifiable as business accounts (e.g., receivables from customers) and except for some proportion of commingled bank deposits. It also agreed that a sole proprietor ought to be canvassed just once, for both his household and his business wealth.

Accordingly, the group recommended that, for data collecting purposes, sole proprietorships be considered as part of the household sector rather than as part of the business sector. The working group assumed, however, that the inventory of business assets and debts of sole proprietorships would be developed so as to be compatible with that of corporations and partnerships.

#### *Selected industries*

For some types of organizations that fall in the nonfarm business sector as defined, reliable information is not presently available for either tangibles or intangibles. This is particularly the case with most tax-exempt groups, including those that report neither to IRS nor to any other public or private agency as well as almost all of those that report to IRS.

The working group decided that, for all industries where both tangible and financial data must be collected "from scratch," whatever vehicle was developed for collecting data on tangible assets should also be used to collect data on financial wealth at the same time. Here also, the group assumed that the statistics so collected could validly be combined with those for other parts of the business universe. For tax-exempt groups that are supposed to report to IRS, it might be possible to use the tax return or a supplemental one-time schedule as a primary source of financial data.

### GENERAL CHARACTERISTICS OF AN INVENTORY OF BUSINESS FINANCIAL WEALTH

#### *Collecting agent*

Wherever possible, an inventory should be taken by expanding or revising existing collection procedures rather than by setting up entirely new procedures or by assigning responsibility to a different agent than the one already collecting balance sheet data for the particular part of the business sector. This recommendation is discussed in more detail in a later section of this report.

*Classification of business units*

For data on financial claims, the business unit would have to be the company rather than the establishment.

In tabulations of these data, businesses should be classified by industry. Detailed recommendations with respect to industry classification are presented in a later section.

The working group did not take up the question of classifying businesses also according to their size. Some such classification would undoubtedly be wanted for many types of analysis, but the size criterion would presumably be total assets or some other measure derived from the balance sheet, and selection of one or more specific classification systems could appropriately be left to those compiling the inventory.

In view of the importance of large, nationwide corporations in the aggregate of business financial claims, classification of businesses by geographic location would not be feasible.

*Information to be collected*

Data should be collected in the form of a complete balance sheet, including liabilities and equity as well as assets, and including broad totals for tangible assets in addition to detailed categories of financial assets. Two major needs, which an inventory should be designed to meet, are for data to permit analysis of liquidity and rates of return, and for data to facilitate derivation of current estimates (especially in nonmanufacturing industries); meeting these needs requires a complete balance sheet, not just selected statistics on financial assets. While detailed information on tangible assets can be obtained more directly by surveying establishments, broad aggregates of real assets, obtained on the same company-unit, balance-sheet basis as the data collected for other assets, are not only necessary for computation of net worth but could also provide a helpful tie-in to the detailed data for real assets. To facilitate this tie-in, the group recommended that consideration be given to coding establishments not only according to their own industry grouping but also according to the group in which the parent company falls.

In order to provide benchmark measures of flows as well as of stocks, data should be collected for both the beginning and the end of the survey year.

The classification of financial assets and debts should be sufficiently detailed to segregate significant types of claims and to permit cross-classifications of assets and debts by sector (though not by industry of holder and issuer within the business sector).

The unique terminology and balance sheet presentation customary in different industries should be recognized in taking an inventory. While a standard set of stub lines should be provided for the use of those compiling the final inventory statistics, this should be adapted—to the actual collection process—to the format to which respondents are accustomed. Thus the schedule sent to manufacturers would look quite different from that sent to life insurance companies but both would be reconcilable to the same standard form. The working group felt that this procedure would not only make reporting easier for businesses, but would also provide greater consistency in the final classification of accounts because the collecting agency, rather than

each respondent, would make the translation from the special to the uniform stub. In line with this recommendation, the group developed a proposed stub for nonfinancial businesses, a sort of checklist stub for financial institutions and several variants of the latter for commercial and mutual savings banks, life insurance companies, and fire and casualty insurance companies. These are included with this report as exhibits D-G and are discussed in some detail in a later section.

*Problems of valuation and nonstandardized accounting*

Use of existing collection channels so far as possible, as recommended by the working group, would limit the extent to which standardized reporting could be required. Ways in which reporting would probably vary from business to business are indicated below, together with the group's recommendations for dealing with these inconsistencies.

*Valuation.*—Businesses would have to be permitted to report all items on a book-value basis. But they should be requested (a) to specify the basis of valuation, where appropriate, and (b) also to enter in a separate column the current market value of each type of marketable security they hold.

The group's recommendations provided for collection of only the book value of stockholders' equity. The members reached no consensus on a meaningful alternative valuation. Some felt that the difference between the market value of assets and the face value of liabilities was meaningful; others preferred the market's valuation of a public corporation's equities, and some approximation of this for closely held corporations and partnerships.

As a general principle, it would seem desirable to request a business to supply the information that only it could provide, and not to request information that the collecting agency could supply. Thus, with respect to other than book values, the business could best provide the market value of certain classes of assets it held; if the collecting agency were to calculate these, the business would have to report its security holdings by issue rather than by class. On the other hand, the collecting or processing agency could calculate the market value of a corporation's publicly traded bonds and stocks, develop methods for estimating market values for other business debts and equities, and, by doing the job itself, provide more consistent and meaningful figures—especially with respect to equities—than would be likely if these valuations were provided by each business.

*Basis of consolidation.*—Businesses would probably have to be permitted to consolidate their subsidiaries in their reports as they saw fit (or, in most cases, as they found most advantageous for tax purposes). The group would prefer a standardized basis of consolidation—probably at the 50-percent ownership level for domestic subsidiaries, with all foreign subsidiaries accounted for on a nonconsolidated basis—but the members concluded that it would not be feasible to require this. However, over the next few years, the basis of consolidation may tend to become more standardized, now that the Revenue Act of 1964 has both removed the 2-percent addition to the tax rate for companies filing consolidated returns and imposed a penalty rate on companies

that file on an extremely nonconsolidated basis in order to escape being subject to surtax.

*Foreign claims.*—A special problem would exist with respect to the consolidation of foreign subsidiaries. The working group assumed that an inventory of net foreign claims would be taken independently of an inventory of domestic wealth, and that it would not be feasible—nor necessarily desirable—to require domestic businesses to exclude all foreign claims from their accounts. This means that any foreign claims included in reported balance sheets of American businesses would, unless adjusted out, be counted twice in the overall inventory.

The working group recommended that businesses be requested to enter, in additional columns on the schedule, the book and market values of the foreign claims they have included—distinguishing between accounts of foreign subsidiaries and affiliates included in the consolidation, and claims of the domestic company on or to other foreigners (including nonconsolidated subsidiaries). At the least, this additional information would permit computation of nonduplicated totals of domestic and net foreign financial claims. Whether it would also provide data that could be incorporated into the inventory of net foreign claims (as an alternative to collecting this part of the inventory in some other way) would depend on how comprehensive such data might be. Some prior exploratory study of corporate reporting practices would be needed.

*Accounting year.*—It probably would not be feasible to collect benchmark statistics that were for the same date for all businesses; each business would have to be permitted to provide balance sheet data as of its own fiscal yearend. For practically all partnerships, sole proprietorships, and financial institutions this would be December 31, but many nonfinancial corporations have accounting years that end on some other date. The fact that "Statistics of Income" data for corporations are for varying dates (fiscal years ending July of one year through June of the next year) has created a longstanding problem for analysts who have had to use these data in conjunction with other economic and financial statistics.

It would be most desirable to have benchmark statistics on business financial claims that were as uniform as most other statistics with respect to dating, but it probably would not be feasible to require all corporations—even all large ones—to submit balance sheets as of December 31. The best that could be done—and this would assure only that the dating for the inventory would be no more varied than is presently the case for "Statistics of Income" tabulations—would be to take the inventory for the same tax year for all businesses.

*Deferred items.*—Another type of inconsistency that may have to be accepted relates to the accounting for installment sales and other deferred credits and charges. Ideally, an inventory designed to complement the national income and product accounts should consistently reflect the same treatment of deferred items as the national accounts. Exploratory work would be needed to determine what kind of reporting instructions, or ex post adjustments, would be most effective for achieving this goal.

*Differences in holder and issuer records.*—In the absence of arbitrary forcing of the data, national totals for the book and/or market value of a given type of financial wealth are different when the total

is compiled from the assets of holders than when it is compiled from the reported debts of issuers. At the national level, the principal sources of difference are probably float and valuation methods.

The working group felt that one of the uses of an inventory could be to provide a rough measure of float, and that float should not be arbitrarily eliminated from the statistics. In part to assist in measuring it, the group recommended reporting procedures designed to reduce the valuation component of the discrepancy between holder and issuer data. Loan assets would be reported gross of bad debt reserves (which would be shown separately, preferably as a liability); security and other valuation reserves, if not shown separately either as a liability or as a deduction from assets, would be reported in a separate column on the schedule.

*Recap of columnar arrangement.*—In several parts of this section, reference has been made to requesting businesses to provide certain information “in a separate column on the schedule.” The working group’s recommendations were developed in terms of an inventory reporting form which would have, for each of the two financial statements filed by a firm, a list of balance sheet categories down the left side and nine columns, as follows, across the top:

(1) Value of item as carried on the books of the company, footnoted to indicate method of valuation, and gross of valuation reserve.

(2) Current market value, also gross of valuation reserve.

(3) Valuation reserves.

Foreign claims included (in dollars):

Consolidated foreign subsidiaries, affiliates, or branches:

(4) Book value.

(5) Current market value.

(6) Valuation reserve.

Other:

(7) Book value.

(8) Current market value.

(9) Valuation reserve.

The columns for market value would apply only to holdings of publicly traded securities. The columns for valuation reserves would apply, if at all, only to asset categories. Only the columns for book values would apply to the liability and equity sections of the balance sheet.

#### COLLECTION PROCEDURES

As noted in the preceding section, the working group felt that an inventory of business financial wealth should be collected so far as possible by utilizing or adapting existing collection procedures.

##### *Business corporations and partnerships*

The organization that should be requested to obtain data for the bulk of corporations and partnerships would seem clearly to be the Internal Revenue Service. This agency already collects balance sheet data from almost all taxable corporations, though the statistics are considerably less detailed than the working group recommended for purposes of an inventory. Provision for the greater detail could be made either by adding a supplement to the regular IRS form, or by using a single, special schedule rather than the regular form for the

survey year only; the choice should depend on the Service's judgment as to which would be more efficient.

For partnerships, the problem of developing satisfactory collection procedures would be considerably more difficult. Many partnerships do not now file balance sheets with IRS, and there seems no reason for expecting this situation to improve by itself over the next few years. But a special enumeration by some agency other than IRS would require use of what is believed to be the only directory of partnerships extant—that maintained by IRS from form 1065 filings.

The members of the group were unanimous in agreeing that wealth data for business partnerships should be collected by IRS. The procedure that seemed most feasible and effective would be for IRS, under its general powers, to make filing of a balance sheet mandatory for the survey year.

#### *Regulated utilities*

Balance sheet data for most of the transportation, communications, and other utility divisions are also collected at present by Federal regulatory commissions. These agencies would be possible vehicles for taking an inventory of financial wealth in these industries, especially if a prime consideration was to lighten the collection burden which IRS was asked to bear.

#### *Banks and insurance companies*

The banking agencies and insurance commissioners might be asked to collect a wealth inventory for the institutions they supervise. IRS might prefer not to cover them, since a specialized form would be required which would differ considerably from the information it generally collects. But this alternative would involve other considerations which the working group was not in a position to weigh.

#### *Pension funds*

The members of the group agreed that any wealth inventory for pension funds should be taken by the Labor Department, though steps would need to be taken well ahead of time to eliminate the difficulties the Department would face in changing or expanding the reports it now receives.

#### *Labor organizations*

The Labor Department should also be responsible for this group. Here again, it is extremely difficult to change the form that is used, so as to obtain greater balance sheet detail. It is possible, however, that discussions with the Department and representatives of the unions might produce a satisfactory arrangement.

#### *College endowment funds*

The working group felt that the kind of survey conducted regularly by the Office of Education (HEW) would probably be adequate for an inventory, though it might be desirable to adjust the timing of the survey now scheduled for 1968, add a few additional details to the reporting forms, and expand the coverage by sampling smaller colleges.

#### *Other tax-exempt organizations*

The group concluded that data for a wealth inventory would probably have to be collected through special surveys.



## INDUSTRIAL CLASSIFICATION

The recommendations of the working group are based on the 1957 Standard Industrial Classification, and will need to be reviewed in the context of the new enterprise classification when this reaches final form.

*General principles*

The skewed distribution of financial asset holdings requires a specialized industrial classification that differs, not in its major categories but in its degrees of detail, from the classifications appropriate for holdings of tangible assets, or from those used for other kinds of business statistics collected by the U.S. Government. In most cases, industrial groupings need to be broader for company figures on financial claims than for establishment statistics on real assets. At the same time there are some groups, especially within finance, where a four-digit classification is more appropriate for intangibles than for tangibles.

Classifications should provide meaningful categories separately for general purposes and for special analyses. The recommended general-purpose breakdowns are shown in exhibit C. The special-purpose categories would be provided by expanding the general-purpose classification to separate the components of combined groupings and to add one more digit to the two- and three-digit codes.

Classification should proceed from left to right in the SIC coding system, not vice versa. That is, in classifying individual corporations and partnerships, the general-purpose code should govern, and should be assigned first. Then, within the general-purpose category, more detail would be added for special uses. The alternative—to classify only according to the most detailed codes which are wanted and to derive broader categories from these—occasionally results in the misclassification of multiproduct companies, at the broader level.

For the general-purpose classification, it should be possible to assign specific codes to most businesses, with minimum last-resort use of "n.e.c." categories. As the classification system becomes more detailed, of course, problems of coding multiproduct businesses become more numerous and more difficult. The special-purpose classifications will be most useful if they are as "clean" as possible. For this reason, the greater detail should be added only where it is meaningful, i.e., in coding individual businesses, liberal use should be made of "n.e.c." or its equivalent, with more precise coding reserved for cases that are clear cut.

The working group felt that, in most nonfinancial industries and for more purposes, coding at the two-digit SIC level would provide as much industrial detail as was either necessary or appropriate for company data on financial claims. However, it strongly recommended three- and four-digit coding for the finance and insurance group. The classifications for this group, as well as other exceptions to two-digit coding are discussed in the paragraphs that follow.

*Mining, construction, transportation, retail trade, and services*

In each of these groupings, the working group felt that a full two-digit SIC breakdown would provide more industrial detail than necessary, and it recommended that some two-digit codes be combined.

Financial claims of businesses in these subgroups do not appear to be very large or to have any unique characteristics that need to be highlighted. For example, there seems no reason to show anthracite (SIC group 11) and bituminous (SIC 12) coal mining separately, or to provide for any subgroups under contract construction (SIC 15, 16, 17).

In transportation, railroads should be shown separately—not just because this is customary, but because of their relatively large holdings of temporary cash investments and because of their distinctive methods of financing acquisition of tangible assets. The only other subgroup that seemed worth segregating was transportation by air. The group decided that all other classes of transportation—water, motor freight, local transit, pipeline—should be combined for the general-purpose classification.

In retail trade, the group recommended segregating general merchandise (SIC 53) and food (SIC 54) but combining all other subgroups. An alternative would have been to segregate the major mail-order houses and nationwide chains, regardless of their line of business, and in this way to isolate the principal retail trade holders of financial assets.

In addition to suggesting that several two-digit SIC service industries be combined with others, the group recommended the establishment of a new group which would comprise businesses engaged in any kind of leasing other than real estate. At present, leasing companies are classified according to the kind of product in which they specialize. But several developments—the growth of leasing in general, the tendency for leasing firms to handle a variety of products, and the increasing interest in knowing more about the financial structure of such companies—make the present method of classifying them unsatisfactory even now. The group felt that the need for this new industry group would be even more obvious by the end of the decade.

### *Manufacturing*

There are two SIC groupings in manufacturing—primary metals (SIC 33) and transportation equipment (SIC 37)—for which classification at the two-digit level is clearly inadequate for purposes of a financial wealth inventory. Producers of primary iron and steel products should be isolated from the first and manufacturers of motor vehicles and equipment from the second. The group also recommended that aircraft and aircraft parts manufacturers be shown separately, largely because of the importance, in their accounts, of their financing arrangements with the Federal Government.

### *Communications and utilities*

The two-digit SIC code is also inadequate for communication companies, but the group felt that splitting communication into just two parts—telephone and all other—would be sufficient.

With respect to utilities, the group felt that a single two-digit code was probably inadequate but that the present three-digit codes are not particularly useful because they classify too many companies as “combination” companies. It recommended that companies be classed as electric utilities if 50 percent or more of their revenues is from this source, and similarly with gas utilities. This is the definition used by SEC in its statistical series. The present three-digit SIC codes classify a utility as a “combination” company unless 95 percent of its revenues comes from a single source.

*Real estate*

Most of the members of the Working Group on Financial Claims initially felt that industrial classification of real estate firms did not need to go beyond the single two-digit SIC code (group 65). However, after consultation with a representative of the Finance, Insurance, and Real Estate Working Group, the general purpose classification was expanded to provide five subcategories at the three- or four-digit level.

*Finance*

The vast bulk of all financial claims in this country flow through the lending and investing institutions that comprise the seven two-digit SIC codes of finance (groups 60-64, 66, 67). The classification recommended by the working group distinguishes 19 different categories under finance.

Most of the 19 were singled out because of their unique characteristics either with respect to the kind of funds that flow to them or with respect to the kind of claims they hold, or both. Some were singled out because they are shown separately in current series and benchmarks are needed to back up the current statistics. Some were singled out because they would probably be handled separately in the actual collection or processing of the inventory and are large enough to be kept separate, even in tabulations by general purpose industrial groupings.

For one or more of the above reasons, the classification recommended by the working group provides for: two groups of banking institutions—commercial banks and trust companies, separate from mutual savings banks; savings and loan associations as a separate group; three categories of consumer credit agencies—credit unions, sales finance companies, consumer finance companies; two classes of specialized business financing agencies—mortgage companies, separate from commercial finance and factoring companies; two categories of brokers and dealers—those handling securities and those handling commodities; three divisions of insurance—life, fraternal, and other; a separate group for private noninsured pension funds; open-end management investment companies separate from other investment companies; and in the hope that some way can be found to collect comprehensive data carrying meaningful valuations, an entirely new group for personal trusts.

Except for the insurance, pension fund, and personal trust groups, each of the subgroups listed above (and two additional miscellaneous groups) are identical with an SIC group, or combination of groups, at the two-, three-, or four-digit level.

## ASSET AND LIABILITY BREAKDOWNS

The balance sheet stub lines recommended by the working group were designed to: Take account of the unique financial structures of some subsectors; provide the same kind of detail when an instrument appears as an asset and when it appears as a liability; permit classification of wealth by sector of holder and by type and maturity of instrument, cross classified by sector of issuer; and minimize the size of "all other" categories.

*Nonfinancial corporations and partnerships*

The balance sheet stub recommended by the working group for collecting financial wealth of nonfinancial corporations and partnerships is shown in exhibit D. The major categories of assets and liabilities are quite similar to those used for the FTC-SEC quarterly financial report (exhibit B), but additional detail has been provided.

*Tangible assets.*—The reasons for including tangibles, in a stub designed to measure intangibles, have already been indicated and will not be repeated here. The amount of detail recommended for fixed assets is the same as that collected regularly by IRS (exhibit A).

*Cash and deposits.*—The working group recommended that currency be collected separately, not because it is believed to have any great economic significance but in order to obtain a "clean" figure for deposits in financial institutions. The categories shown for deposits are those that seem meaningful at present. They might need to be revised for an inventory taken several years from now, to reflect changes that cannot be foreseen—say, a marked decline in the importance of certificates of deposit and/or a substantial shift of time deposits to institutions other than commercial banks.

*Government securities.*—The breakdowns recommended by the working group would separate central government from agency issues and, for each, securities maturing in 1 year or less from those with later maturities. The stub lines are worded so as to cover both U.S. and any foreign issues included; the latter would be segregated in the additional columns described previously.

*Other short-term securities.*—The categories provided are those that are believed to be significant at present. Holdings of finance company paper would be combined with other commercial paper; an alternative would be to show the two types separately as is customary in the current series on outstandings.

*Notes and accounts receivable.*—The working group recommended separating these, first as between current and noncurrent accounts, then according to the sector to which the credit was granted. An exception is the consumer sector; in line with usual reporting practice, all credit advanced to consumers by nonfinancial business would be classified as current. A major reason for recommending that receivables be classified by sector is to permit calculation of more reliable figures for net trade credit.

*Prepaid insurance premiums.*—This item appears to be the most common large component of "other" current assets as usually compiled.

*Categories of noncurrent assets.*—In most published statistics, all noncurrent assets other than property, plant, and equipment are generally combined. The working group recommended that this complex of accounts be split up to isolate investment in nonconsolidated subsidiaries, holdings of long-term securities, noncurrent accounts receivable, deferred charges, and goodwill. A memorandum item would also be provided for equity in nonconsolidated subsidiaries and affiliates, to take care of cases where the value carried on the books was partial or artificial.

The long-term securities category would be divided along rather broad lines. Thus holdings of long-term corporate securities would be separated only into bonds and stocks; a more detailed breakdown which would isolate publicly traded securities, to which meaningful market values could be assigned, might be desirable. Also, corporate

holdings of mortgages would be included in an "all other" category; perhaps they should be shown separately.

*Liabilities.*—The liability categories recommended by the working group were designed to: Provide three maturity classes for debt (though the group doubted that these would provide as much information as analysts would want); separate contractual debts to banks and to other lenders from trade debt owed to the Government and to trade suppliers; divide up the usual "other" current liabilities category into what were believed to be its major components; and provide enough detail on long-term debt to make these borrowings data comparable, at least conceptually, with data to be collected for lenders.

*Stockholders' equity.*—The working group recommended collecting only very broad categories of stockholders' equity. Surplus reserves would be shown separately, both to assure their exclusion from liability accounts and to permit the user to net them against assets if he wishes. Capital and earned surplus would not be separated from common stock.

#### *Financial institutions and intermediaries*

The stub lines recommended for financial institutions were designed to recognize the unique liability accounts that occur in finance, and to provide the kind of detail on financial assets of lending institutions that the group felt should be collected if at all possible. These proposed stub lines (excluding tangibles, which would also be collected) are listed in exhibit E. In the remaining exhibits, these stub lines have been arranged so as to illustrate their relationship to the asset and liability items presently supplied by banks, in the call report, and by life insurance and fire and casualty insurance companies, in commissioners' annual statements. Similar illustrative exhibits could be prepared for savings and loan associations, pension funds, securities brokers and dealers, etc.

*Assets.*—The working group felt strongly that a reliable matrix of financial claims would require a considerable improvement in the classification of loans made: to show type of loan, by type of borrower—e.g., government, corporate, partnership—by broad maturity class.

The recommended breakdown by type of loan is similar to that recommended for nonfinancial industries. It is less detailed than many lenders are accustomed to reporting, and does not call for some classifications that analysts might want. For example, no classification of residential mortgages by number of units in the property (e.g., 1- to 4-family, multifamily; or single family, 2- to 4-family, multifamily) is provided, partly because the group was unable to determine what classification would be preferred and partly because it gave higher priority to a classification by debtor group.

The further break by type of borrower is quite broad and does not require industrial detail. However, it does call for classification of business borrowers by legal form of organization.

The final division, by maturity, provides for just three classes—short term (including demand notes), current maturities on long term, other long term. It will be noted that all three maturity classes are listed under several types of loan usually thought of as long term only; this is because these types are also issued as demand notes and/or in serial form with some short maturities. No maturity distribution has been provided for any type of open-market paper, since all such paper now outstanding appears to have been issued with a maturity of 1 year or less.

The working group recognized that loan information classified according to the breakdowns it recommended could not be collected at present, as it is not available in lenders' records. Most members of the group were not convinced that it could never be collected. However, one or two members felt that the loan details recommended would be very difficult for lenders to develop, were not compatible with present automated recordkeeping procedures, and hence would be inordinately costly and time consuming for lenders to report. The group recommended that banks and other lenders be advised, a year or more in advance, of what information would be required for an inventory, that pilot tests be conducted to determine whether the problems of collecting comprehensive data on loans by sector are in fact insurmountable, and that, if necessary, the detailed information be collected only on a sample basis.

*Liabilities and stockholders' equity.*—The liability and equity accounts would of course vary considerably among groups of financial institutions. For the most part they would be identical with current reporting practices. Some additional detail would be required, however, primarily to build out the sectoral cross-classifications and to provide presently unavailable information on valuation reserves. Some of the additional details on sector balances, or techniques for obtaining them, may be more readily available several years from now than they are at present.

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EXHIBIT A

BALANCE SHEET STUB: FORM 1120. STATISTICS OF INCOME—1963, U.S. CORPORATION INCOME TAX RETURNS

ASSETS

Cash.  
 Notes and accounts receivable.  
     Less: Reserve for bad debts.  
 Inventories.  
 Investments in Government obligations.  
 Other current assets.  
 Loans to stockholders.  
 Other investments.  
 Buildings and other fixed depreciable assets.  
     Less: Accumulated amortization and depreciation.  
 Depletable assets.  
     Less: Accumulated depletion.  
 Land (net of any amortization).  
 Intangible assets (amortizable only).  
     Less: Accumulated amortization.  
 Other assets.  
     Total assets.

LIABILITIES AND CAPITAL

Accounts payable.  
 Mortgages, notes, and bonds payable in less than 1 year.  
 Other current liabilities.  
 Loans from stockholders.  
 Mortgages, notes, and bonds payable in 1 year or more.  
 Other liabilities.  
 Capital stock: Preferred.  
 Capital stock: Common.  
 Paid-in or capital surplus.  
 Surplus reserve.  
 Earned surplus and undivided profits.  
     Total liabilities and capital.

## EXHIBIT B

## BALANCE SHEET STUB: QUARTERLY FINANCIAL REPORT FOR MANUFACTURING CORPORATIONS

## ASSETS

Cash on hand and in bank.  
 U.S. Government securities, including Treasury savings notes.  
     Total cash and U.S. Government securities.  
 Receivables from U.S. Government, excluding tax credits.  
 Other notes and accounts receivable (net).  
     Total receivables.  
 Inventories.  
 Other current assets.  
     Total current assets.  
 Property, plant, and equipment.  
     Deduct: Reserve for depreciation and depletion.  
     Total property, plant, and equipment (net).  
 Other noncurrent assets.  
     Total assets.

## LIABILITIES AND STOCKHOLDERS' EQUITY

Short-term loans from banks (original maturity of 1 year or less).  
 Advances and prepayments by U.S. Government.  
 Trade accounts and notes payable.  
 Federal income taxes accrued.  
 Installments, due in 1 year or less, on long-term debt:  
     Loans from banks.  
     Other long-term debt.  
 Other current liabilities.  
     Total current liabilities.  
 Long-term debt due in more than 1 year:  
     Loans from banks.  
     Other long-term debt.  
 Other noncurrent liabilities.  
     Total liabilities.  
 Reserves not reflected elsewhere.  
 Capital stock, capital surplus, and minority interest.  
 Earned surplus and surplus reserves.  
     Total stockholders' equity.  
     Total liabilities and stockholders' equity.

## EXHIBIT C

## PROPOSED INDUSTRIAL CLASSIFICATION

<i>Industry</i>	<i>1957 SIC code</i>
Mining:	
Metal mining-----	10.
Coal mining-----	11, 12.
Petroleum and natural gas-----	13.
Other mining-----	14.
Construction-----	15-17.
Manufacturing:	
Food and kindred products-----	20.
Tobacco manufactures-----	21.
Textile mill products-----	22.
Apparel and other finished products-----	23.
Lumber and wood products, except furniture-----	24.
Furniture and fixtures-----	25.
Paper and allied products-----	26.
Printing and publishing-----	27.
Chemicals and allied products-----	28.
Petroleum refining and related industries-----	29.
Rubber and miscellaneous plastics products-----	30.

<i>Industry</i>	<i>1957 SIC code</i>
Leather and leather products.....	31.
Stone, clay, and glass products.....	32.
Primary iron and steel.....	331, 332, 3391.
Primary nonferrous and primary metal ind., not elsewhere classified.....	333-336, 3392, 3399.
Fabricated metal products.....	34.
Machinery, except electrical.....	35.
Electrical machinery.....	36.
Motor vehicles and equipment.....	371.
Aircraft and parts.....	372.
All other transportation equipment.....	373-379.
Instruments and related products.....	38.
Ordinance and miscellaneous manufacturing.....	19, 39.
Transportation:	
Railroad.....	40.
Air transportation.....	45.
Other transportation.....	41, 42, 44, 46, 47.
Communication:	
Telephone.....	481.
Other communication.....	482, 483, 489.
Utilities:	
Electric companies and systems (50 percent or more).....	(491, pt. 493). <sup>1</sup>
Gas companies and systems (50 percent or more)....	(492, pt. 493). <sup>1</sup>
Other utilities.....	(Rest 493, 494-497). <sup>1</sup>
Wholesale trade.....	50.
Retail trade:	
General merchandise.....	53.
Food.....	54.
All other.....	52, 55-59.
Real estate:	
Operators of residential properties.....	6513, 6514.
Operators of commercial and industrial properties..	6512.
Other operators, including lessors.....	6515-19.
Subdividers, developers, and operative builders....	655, 656.
All other.....	653, 654.
Finance:	
Commercial banks and trust companies.....	602, 604.
Mutual savings banks.....	603.
Savings and loan associations.....	612.
Credit unions.....	6142, 6143.
Consumer finance companies.....	6145.
Sales finance companies.....	6146.
Mortgage companies.....	6152.
Commercial finance companies and factors.....	6153.
Miscellaneous credit agencies.....	611, 613, 6144, 6149, 6159, 616.
Security brokers and dealers.....	621.
Commodity brokers and dealers.....	622.
Life insurance companies.....	(Pt. 631). <sup>1</sup>
Fraternal insurance.....	(Pt. 6313, pt. 6323). <sup>1</sup>
Other insurance.....	(Pt. 632, 633, 635, 636, pt. 639). <sup>1</sup>
Management investment companies, open-end.....	6722.
Other investment companies.....	6723-6725.
Private noninsured pension funds.....	(Pt. 639). <sup>1</sup>
Personal trusts.....	(1).
All other.....	605, 623, 628, 64, 66, 671, 673, 679.

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See footnote, p. 820.



<i>Industry</i>	<i>1957 SIC code</i>
Services:	
Hotels, etc.....	70.
Personal services.....	72.
Automobile repair, and miscellaneous repair services.....	75, 76.
Motion pictures.....	78.
Amusements, except motion pictures.....	79.
Medical and educational services.....	80, 82.
Business and legal services.....	73, 81.
Leasing companies.....	(1).
All other.....	84, 86, 89.

<sup>1</sup> No equivalent 2-, 3-, or 4-digit SIC code. Figures in parentheses indicate nearest equivalent.

#### EXHIBIT D

#### PROPOSED BALANCE SHEET STUB: NONFINANCIAL CORPORATIONS AND PARTNERSHIPS

##### ASSETS

Cash and deposits:

- Currency.
- Demand deposits.
- Time deposits:
  - Open account.
  - Certificates of deposit.

Central Government and agency securities:

- Treasury bills.
- Other Treasury securities due in 1 year or less.
- Treasury securities due in more than 1 year.
- Agency securities due in 1 year or less.
- Agency securities due in more than 1 year.

Other short-term securities:

- Finance company paper.
- Commercial paper.
- Bankers' acceptances.
- State, provincial, and local securities due in 1 year or less.
- Other.

Inventories.

Notes and accounts receivable (current):

- From business:
  - Subsidiaries and affiliates.
  - Other businesses.
- From consumers:
  - Installment.
  - Noninstallment.
- From Government.
- From others.

Prepaid insurance premiums.

Other current assets.

- Total current assets.

Property, plant, and equipment (net):

- Depreciable assets (gross).
  - Less accumulated depreciation.
- Depletable assets (gross).
  - Less accumulated depletion.
- Land.

Investment in nonconsolidated subsidiaries and affiliates.

Other securities :

State, provincial, and local securities due in more than 1 year.

Long-term corporate securities :

Bonds.

Stocks.

Other, including mortgages.

Noncurrent accounts receivable :

From business :

Subsidiaries and affiliates.

Other businesses.

From others.

Deferred charges.

Goodwill and other intangibles.

Other noncurrent assets.

Total assets.

Memo : Equity in nonconsolidated subsidiaries and affiliates.

#### LIABILITIES

Short-term loans from banks (original maturity 1 year or less).

Advances and prepayments from Government.

Notes and accounts payable to suppliers :

Subsidiaries and affiliates.

Other suppliers.

Other short-term borrowings :

In the open market.

From finance companies.

From officers or stockholders.

From others.

Dividends payable.

Accrued Federal income taxes (excluding reserves for future or deferred taxes, renegotiation, etc.)

Other accruals :

Accrued payrolls.

Other.

Installments, due in 1 year or less, on long-term debt :

Mortgages :

From commercial banks.

From others :

Life insurance companies.

Other financial institutions.

Others.

Term loans from banks.

Bonds, notes, debentures :

Publicly offered.

Privately placed.

Other long-term loans :

From financial institutions.

From officers or stockholders.

From others.

Other current liabilities.

Total current liabilities.

## Long-term debt due in more than 1 year :

## Mortgages :

From commercial banks.

From others :

Life insurance companies.

Other financial institutions.

Others.

Term loans from banks.

Bonds, notes, debentures :

Publicly offered.

Privately placed.

Other long-term loans :

From financial institutions.

From officers or stockholders.

From others.

Other noncurrent liabilities.

Total liabilities

## EQUITY

Reserves not reflected elsewhere (including reserve for bad debts).

Preferred stock.

Common stock, capital surplus, and earned surplus.

Partners' capital accounts.

Total stockholders' or partners' equity.

## EXHIBIT E

## PROPOSED BALANCE SHEET STUB: FINANCIAL INSTITUTIONS

(Checklist of categories other than tangible assets)

FINANCIAL ASSETS <sup>1</sup>

## Cash and deposits :

Currency.

Demand deposits :

Cash items in process of collection.

Other demand deposits.

Time deposits in commercial banks :

Certificates of deposit.

Other time deposits in commercial banks.

Deposits and savings shares in other private financial institutions.

Deposits in Federal financial institutions.

## Central Government and agency securities and loans :

Treasury bills.

Other Treasury securities due in 1 year or less :

Marketable.

Nonmarketable.

Treasury securities due in more than 1 year :

Marketable.

Nonmarketable.

Agency securities due in 1 year or less.

Agency securities due in more than 1 year (including stocks).

Loans to Central Government agencies, due in 1 year or less.

Loans to Central Government agencies, due in more than 1 year.

## State, provincial, and local securities :

Original maturity 1 year or less.<sup>2</sup>

Long-term debt or installments due in 1 year or less.

Long-term debt due in more than 1 year.

Commercial paper.

Finance company paper.

Bankers' acceptances.

<sup>1</sup> See footnotes, p. 825.

**Advances to affiliated companies :**Original maturity 1 year or less.<sup>2</sup>

Long-term debt or installments due in 1 year or less.

Long-term debt due in more than 1 year.

**Real estate mortgages :<sup>3</sup>****Construction loans :**

Owed by corporations :

Original maturity 1 year or less.<sup>2</sup>

Long-term debt or installments due in 1 year or less.

Long-term debt due in more than 1 year.

Owed by partnerships.

(Three maturity classes, as above.)

Owed by nonbusiness institutions.

(Three maturity classes.)

Owed by individuals, including sole proprietorships.

(Three maturity classes.)

Other, secured by residential property.

(Four debtor groups, by three debt maturity classes, as above.)

Other, secured by farm property.

(Four debtor groups, by three debt maturity classes.)

Other real estate mortgages.

(Four debtor groups, by three debt maturity classes.)

**Bonds and debentures :**

Owed by corporations :

Privately placed.

(Three maturity classes.)

Publicly offered.

(Three maturity classes.)

Owed by nonbusiness institutions.

(Three maturity classes.)

**Policy loans.****Security loans.****Other loans :**

Owed by corporations.

(Three maturity classes.)

Owed by partnerships.

(Three maturity classes.)

Owed by nonbusiness institutions.

(Three maturity classes.)

Owed by individuals, including sole proprietorships :

**Installment loans :**

Business loans.

(Three maturity classes.)

Consumer loans.

(Three maturity classes.)

**Single-payment loans.**

Business loans.

(Three maturity classes.)

Other loans.

(Three maturity classes.)

**Accrued income and other miscellaneous assets :**

Prepaid insurance premiums.

Interest due and receivable.

Dividends due and receivable.

Goodwill and other intangibles.

Other.

**Stocks and other equities :**

Investment (or equity) in nonconsolidated subsidiaries, affiliates, and parents.

**Other equities :**

Preferred stocks.

**Common stocks :**

Rights and warrants.

Other.

Total, financial assets.

See footnotes, p. 825.

## LIABILITIES AND EQUITY

## Demand deposits:

## Owed to—

- Other banks.
- Nonbank financial institutions.
- Central governments and agencies.
- State, provincial, and local governments and agencies.
- Nonfinancial corporations.
- Partnerships.
- Nonbusiness institutions.
- Trust accounts administered by banks:
  - Pension funds.
  - Other corporate accounts.
  - Personal accounts.
- Individuals:
  - Business accounts.
  - Other accounts.

## Time and savings deposits and shares:

## Time certificates of deposit.

## Other time and savings deposits and shares:

## Owed to—

- Other banks.
- Nonbank financial institutions.
- Central governments and agencies.
- State, provincial, and local governments and agencies.
- Nonfinancial corporations.
- Partnerships.
- Nonbusiness institutions.
- Trust accounts administered by banks:
  - Pension funds.
  - Other corporate accounts.
  - Personal accounts.
- Individuals:
  - Business accounts.
  - Other accounts.

## Insurance and pension liabilities:

## Life insurance policy reserves.

## Pension contract reserves.

## Accident and health policy reserves and unearned premiums.

## Other nonlife insurance reserves, unpaid losses, and unearned premiums:

## Reserves and unpaid losses.

## Unearned premiums:

- Paid by corporations.
- Paid by partnerships.
- Paid by nonbusiness institutions.
- Paid by governments.
- Paid by individuals.
- Memorandum: Portion of total unearned premiums to—
  - Stockholders' account.
  - Policyholders' account.

## Notes and accounts payable to suppliers.

## Other short-term borrowings:

- From regulatory authorities.
- From commercial banks.
- From finance companies.
- From affiliated companies.
- From officers and stockholders.
- Other open market.
- From others.

## Accrued expenses:

- Accrued Federal income taxes (excluding reserves for future or deferred taxes, renegotiation, etc.).
- Other taxes payable.
- Interest payable.
- Commissions due to salesmen or representatives.
- Other accrued payrolls.
- Other accrued expenses.

Unamortized premiums: <sup>1</sup>	U.S. Treasury bonds.
	U.S. agency bonds.
	State and local bonds.
	Corporate bonds.
	Mortgages.
Escrow accounts not included elsewhere.	
Long-term debt or installments, due in 1 year or less on—	Advances from affiliated companies.
	Real estate mortgages.
	Other loans, from banks.
	Other bonds, notes, and debentures.
	Other long-term debt.
Other current liabilities:	Dividends payable to stockholders.
	Dividends payable to policyholders (if not included in reserves above).
	Dividends payable to depositors.
	Other.
Long-term debt due in more than 1 year:	Advances from affiliated companies.
	Real estate mortgages.
	Other loans from banks.
	Other bonds, notes, and debentures.
	Other long-term debt.
Other noncurrent liabilities.	
Stockholders' equity:	Reserves not reflected elsewhere: <sup>2</sup>
	Bad debt reserves.
	Mandatory security valuation reserve.
	Other security valuation reserves:
	Bonds.
	Loans.
	Stocks.
	Reserves for future or deferred taxes, renegotiation, etc.
	Other reserves.
	Preferred stock.
	Common stock and paid-in surplus.
	Earned surplus. <sup>4</sup>
	Total, liabilities and equity.

<sup>1</sup> Asset items should be reported gross of reserves. The reserves should be entered on credit side of account under "Unamortized premiums" or "Reserves not reflected elsewhere."

<sup>2</sup> Include demand obligations here.

<sup>3</sup> Excluding "loans in process."

<sup>4</sup> Include also "undivided profits," "surplus," "policyholders' surplus" (when not included under "Insurance and pension liabilities" above).

#### EXHIBIT F

#### PROPOSED BALANCE SHEET STUB: COMMERCIAL AND MUTUAL SAVINGS BANKS

(Adaptation of exhibit E)

NOTE.—Items presently available from Call Report are shown in italics; totals available, but not presently shown in this form in Call Report schedule, are identified by asterisks. Additional details suggested for wealth inventory are in roman type.

#### ASSETS

*Cash, balances with other banks, and cash collection items:*

*Currency and coin.*

*Reserve with Federal Reserve banks.*

*Demand balances with banks in the United States.*

*Other balances with banks in the United States:*

*Certificates of deposit.*

*Other balances.*

*Balances with banks in foreign countries:*

*Demand balances.*

*Time balances.*

*Cash items in process of collection.*

*Obligations of the U.S. Government, direct and guaranteed:**Treasury bills.**Other Treasury marketable securities due in 1 year or less:\***Treasury certificates of indebtedness.**Treasury notes maturing in 1 year or less.**Other bonds maturing in 1 year or less.**Treasury marketable securities due in more than 1 year:\***Treasury notes maturing after 1 year.**Other bonds maturing in 1 to 5 years.**Other bonds maturing in 5 to 10 years.**Other bonds maturing after 10 years.**U.S. nonmarketable bonds:**Savings bonds.**Other nonmarketable bonds maturing in 1 year or less.**Other nonmarketable bonds maturing after 1 year.**Guaranteed obligations:**Maturing in 1 year or less.**Maturing after 1 year.**Other securities:\***Obligations of States and subdivisions:**Original maturity 1 year or less.<sup>1</sup>**Long-term debt due in 1 year or less.<sup>2</sup>**Long-term debt due in more than 1 year.**Securities of Federal agencies and corporations.**(Three maturity classes, as above.)**Other bonds, notes, and debentures:\***Owed by business corporations.**(Three maturity classes.)**Owed by nonbusiness institutions.**(Three maturity classes.)**Owed by foreign governments and instrumentalities, and by international institutions.**(Three maturity classes.)**Federal Reserve bank stock.**Other corporate stocks:\***Shares in building and loan associations and credit unions.**Preferred stocks:**Affiliates' issues.**Other preferred stocks.**Common stocks:**Affiliates' issues.**Rights and warrants.**Other common stocks.**Loans and discounts:**Real estate loans:\***Secured by farmland:**Owed by corporations:**Original maturity 1 year or less.<sup>1</sup>**Long-term debt due in 1 year or less.<sup>2</sup>**Long-term debt due in more than 1 year.**Owed by partnerships.<sup>3</sup>**(Three maturity classes, as above.)**Owed by individuals.<sup>3</sup>**(Three maturity classes.)**Secured by residential properties, insured by FHA:**Owed by corporations:**Due in 1 year or less.<sup>2</sup>**Due in more than 1 year.**Owed by partnerships.<sup>3</sup>**(Two maturity classes, as above.)**Owed by individuals.<sup>3</sup>**(Two maturity classes.)**Secured by residential properties, insured or guaranteed by VA.**(Two maturity classes.)*

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See footnotes, p. 830.

*Secured by residential properties, not insured or guaranteed by FHA or VA:*

- Owed by corporations:
  - Construction loans:
    - Original maturity 1 year or less.<sup>1</sup>
    - Long-term debt due in 1 year or less.<sup>2</sup>
    - Long-term debt due in more than 1 year.
  - Other loans on residential properties.
    - (Three maturity classes, as above.)
- Owed by partnerships:<sup>3</sup>
  - Construction loans.
    - (Three maturity classes.)
  - Other loans on residential properties.
    - (Three maturity classes.)
- Owed by individuals:<sup>3</sup>
  - Construction loans.
    - (Three maturity classes.)
  - Other loans on residential properties.
    - (Three maturity classes.)

*Secured by other properties:*

- Owed by corporations:
  - Construction loans.
    - (Three maturity classes.)
  - Other loans on nonfarm, nonresidential properties.
    - (Three maturity classes.)
- Owed by nonbusiness institutions:
  - Construction loans.
    - (Three maturity classes.)
  - Other loans on nonfarm, nonresidential properties.
    - (Three maturity classes.)
- Owed by partnerships:<sup>3</sup>
  - Construction loans.
    - (Three maturity classes.)
  - Other loans on nonfarm, nonresidential properties.
    - (Three maturity classes.)
- Owed by individuals:<sup>3</sup>
  - Construction loans.
    - (Three maturity classes.)
  - Other loans on nonfarm, nonresidential properties.
    - (Three maturity classes.)

*Loans to domestic commercial and foreign banks:*

- Advances to affiliated companies.
  - (Three maturity classes.)
- Other loans to domestic, commercial, and foreign banks.
  - (Three maturity classes.)

*Loans to other financial institutions:*

- Finance company paper.
- Other loans to other financial institutions.
  - (Three maturity classes.)

*Loans to brokers and dealers in securities:*

- Owed by corporations.
  - (Three maturity classes.)
- Owed by partnerships.<sup>3</sup>
  - (Three maturity classes.)
- Owed by individuals.<sup>3</sup>
  - (Three maturity classes.)

*Other loans for purchasing or carrying securities:*

- Owed by corporations, including investment trusts.
  - (Three maturity classes.)
- Owed by partnerships.<sup>3</sup>
  - (Three maturity classes.)
- Owed by individuals.<sup>3</sup>
  - (Three maturity classes.)

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See footnotes, p. 830.



*Loans to farmers directly guaranteed by the OCC.**Other loans to farmers:*

- Owed by corporations.  
(Three maturity classes.)
- Owed by partnerships.<sup>3</sup>  
(Three maturity classes.)
- Owed by individuals.<sup>3</sup>  
(Three maturity classes.)

*Commercial and industrial loans:*

- Open-market paper:  
Commercial paper.  
Bankers' acceptances.
- Other commercial and industrial loans:  
Owed by corporations.  
(Three maturity classes.)
- Owed by partnerships.<sup>3</sup>  
(Three maturity classes.)
- Owed by individuals.<sup>3</sup>  
(Three maturity classes.)

*Other loans to individuals for personal expenditures:**Passenger automobile installment loans:*

- Installments due in 1 year or less.
- Installments due in more than 1 year.

*Other retail consumer installment loans:*

- Installments due in 1 year or less.
- Installments due in more than 1 year.

*Residential repair and modernization installment loans.*

- Installments due in 1 year or less.
- Installments due in more than 1 year.

*Other installment loans for personal expenditures:*

- Installments due in 1 year or less.
- Installments due in more than 1 year.

*Single-payment loans for personal expenditures:*

- Original maturity 1 year or less.<sup>1</sup>
- Long-term debt due in 1 year or less.<sup>2</sup>
- Long-term debt due in more than 1 year.

*All other loans (including overdrafts):**Overdrafts:*

- Owed by:  
Corporations.  
Nonbusiness institutions.  
Partnerships.<sup>3</sup>  
Individuals.<sup>3</sup>
- Loans to Federal Government agencies, n.e.c.  
(Three maturity classes.)
- Loans to nonbusiness institutions.  
(Three maturity classes.)

*Bank premises, furniture and fixtures, and other real estate.\***Miscellaneous assets:\***Customers' liability on acceptances outstanding:*

- Owed by corporations.
- Owed by partnerships.<sup>3</sup>
- Owed by individuals.<sup>3</sup>

*Securities borrowed.**Income earned or accrued but not collected:*

- Interest due and receivable.
- Dividends due and receivable.
- Other income earned but not collected.

*Insurance and other expenses prepaid:*

- Insurance expenses prepaid.
- Other expenses prepaid.

*Cash items not in process of collection.**All other:*

- Goodwill and other intangibles.
- Other.

*Total assets.*


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See footnotes, p. 830.

## LIABILITIES AND CAPITAL ACCOUNTS

*Business and personal deposits: \***Individuals, partnerships and corporations—demand:*

## Trust accounts administered by banks:

- Pension funds.
- Other corporate accounts.
- Personal accounts.

## Instrumentalities of U.S. Government.

## Nonbank financial institutions.

## Other business corporations.

## Nonbusiness institutions.

Partnerships.<sup>a</sup>Individuals:<sup>a</sup>

- Deposits accumulated for payment of personal loans.
- Business accounts.
- Other accounts.

*Individuals, partnerships, and corporations—Time: \***Savings deposits.**Deposits accumulated for payment of personal loans.**Other deposits of I., P., & C.:*

## Time certificates of deposit.

## Other time deposits of I., P., &amp; C.:

## Trust accounts administered by banks:

- Pension funds.
- Other corporate accounts.
- Personal accounts.

## Nonbank financial institutions.

## Other business corporations.

## Nonbusiness institutions.

Partnerships.<sup>a</sup>Individuals:<sup>a</sup>

- Business accounts.
- Other accounts.

*Certified and officers checks, etc.:*

## Nonbank financial institutions.

## Other business corporations.

## Nonbusiness institutions.

Partnerships.<sup>a</sup>Individuals.<sup>a</sup>*Government deposits: \***U.S. Government—Demand.**U.S. Government—Time.**States and subdivisions—Demand.**States and subdivisions—Time.**Domestic interbank and postal savings deposits: \***Commercial banks in the United States—Demand: \**

## Affiliated banks.

## Others.

*Commercial banks in the United States—Time: \**

## Affiliated banks.

## Others.

*Mutual savings banks in the United States—Demand.**Mutual savings banks in the United States—Time.**Postal savings.**Foreign government and bank deposits: \***Foreign governments, central banks, etc.—Demand.**Foreign Governments, central banks, etc.—Time.**Banks in foreign countries—Demand.**Banks in foreign countries—Time.*


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See footnotes, p. 830.

*Mortgages on bank premises and on other real estate.**Miscellaneous liabilities:\***Rediscouunts and other borrowed money:*

Federal Reserve banks.  
Other Federal Government agencies.  
Other banks:

Affiliated banks.  
Nonaffiliated banks.

Accounts payable to suppliers.  
Other borrowed money.

*Acceptances outstanding.**Securities borrowed.**Dividends declared, but not yet payable.**Income collected, but not yet earned.**Expenses accrued and unpaid:*

Accrued Federal income taxes.  
Other taxes payable.  
Interest payable.  
Accrued payrolls.  
Other accrued expenses.

*All other miscellaneous liabilities.\***Total liabilities (excluding capital accounts).**Capital accounts:**Common stock.**Capital notes and debentures:*

Original maturity 1 year or less.<sup>1</sup>  
Long-term debt due in 1 year or less.<sup>2</sup>  
Long-term debt due in more than 1 year.

*Preferred stock.**Surplus.**Undivided profits.**Reserves.**Total liabilities and capital accounts.*

## RESERVES OFFSET AGAINST ASSETS IN CALL REPORT

## Reserves for bond premiums:

Obligations of U.S. Government.  
Obligations of States and subdivisions.  
Securities of Federal agencies and corporations.  
Other bonds, notes, and debentures.

## Valuation allowances:

Obligations of U.S. Government.  
Obligations of States and subdivisions.  
Securities of Federal agencies and corporations.  
Other bonds, notes, and debentures.  
Federal Reserve bank stock.  
Other corporate stocks.  
Loans and discounts.  
Bank premises, furniture and fixtures.

Total valuation reserves.

Total capital accounts and valuation reserves.

<sup>1</sup> Include here items due on demand.

<sup>2</sup> Include installments on long-term debt coming due within 1 year, and other debt with original maturity of more than 1 year but coming due within 1 year.

<sup>3</sup> Joint accounts of husbands and wives, or other members of families living together, should be classified as "individual" and not as "partnership."

## EXHIBIT G

## PROPOSED BALANCE SHEET STUB: INSURANCE CARRIERS

(Adaptation of exhibit E)

NOTE.—Items appearing in Commissioners' annual statement form are shown in italic. Additional details suggested for wealth inventory are in roman type.

## ASSETS

*Bonds:**Governments, including obligations guaranteed by United States:*

Treasury bills.

Other marketable Treasury securities:

Maturing in 1 year or less.

Maturing in more than 1 year.

Nonmarketable Treasury securities:

Maturing in 1 year or less.

Maturing in more than 1 year.

Guaranteed obligations:

Maturing in 1 year or less.

Maturing in more than 1 year.

*States, territories, and possessions:*Original maturity 1 year or less.<sup>1</sup>Long-term debt due in 1 year or less.<sup>2</sup>

Long-term debt due in more than 1 year.

*Political subdivisions of States, territories, and possessions:*Original maturity 1 year or less.<sup>1</sup>Long-term debt due in 1 year or less.<sup>2</sup>

Long-term debt due in more than 1 year.

*Special revenue and special assessment obligations.*

(Three maturity classes, as above.)

*Railroads:*

Privately placed.

(Three maturity classes.)

Publicly issued.

(Three maturity classes.)

*Public utilities:*

Privately placed.

(Three maturity classes.)

Publicly issued.

(Three maturity classes.)

*Industrial and miscellaneous:*

Nonguaranteed Government securities.

(Three maturity classes.)

International agency.

(Three maturity classes.)

Nonbusiness institutions.

(Three maturity classes.)

Other industrial and miscellaneous:

Privately placed.

(Three maturity classes.)

Publicly issued.

(Three maturity classes.)

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See footnotes, p. 835.

*Stocks:**Railroad:**Preferred stocks.**Common stocks:*

Other.

*Public utilities:**Preferred stocks.**Common stocks:*

Rights and warrants.

Other.

*Banks and trust companies:**Preferred stocks.**Common stocks:*

Rights and warrants.

Other.

*Savings and loan.**Insurance:**Affiliated companies:**Preferred stocks.**Common stocks.**Other insurance:**Preferred stocks.**Common stocks:*

Rights and warrants.

Other.

*Industrial and miscellaneous:**Preferred stocks.**Common stocks:*

Rights and warrants.

Other.

*Mortgage loans on real estate:**Farm mortgages—Purchase money and other:*

Owed by corporations:

Original maturity 1 year or less.<sup>1</sup>Long-term debt due in 1 year or less.<sup>2</sup>

Long-term debt due in more than 1 year.

Owed by partnerships.<sup>3</sup>

(Three maturity classes, as above.)

Owed by individuals.<sup>3</sup>

(Three maturity classes.)

*City mortgages—Insured or guaranteed:*

Owed by corporations:

Due in 1 year or less.<sup>2</sup>

Due in more than 1 year.

Owed by partnerships.<sup>3</sup>

(Two maturity classes, as above.)

Owed by individuals.<sup>3</sup>

(Two maturity classes.)

*City mortgages—Purchase money and all other:*

Secured by residential properties:

Owed by corporations:

Original maturity 1 year or less.<sup>1</sup>Long-term debt due in 1 year or less.<sup>2</sup>

Long-term debt due in more than 1 year.

Owed by partnerships.<sup>3</sup>

(Three maturity classes, as above.)

Owed by individuals.<sup>3</sup>

(Three maturity classes.)

Secured by nonresidential properties:

Owed by corporations.

(Three maturity classes.)

Owed by nonbusiness institutions.

(Three maturity classes.)

Owed by partnerships.<sup>3</sup>

(Three maturity classes.)

Owed by individuals.<sup>3</sup>

(Three maturity classes.)

*Real estate.*

*Policy loans.*

*Premium notes.*

*Collateral loans.*

*Cash and bank deposits.*

*Cash in company's offices or in transit.*

*Deposits in banks and trust companies:*

*Demand deposits.*

*Time deposits in commercial banks:*

*Certificates of deposit.*

*Other.*

*Deposits in other private financial institutions.*

*Premiums guaranteed under Soldiers' and Sailors' Civil Relief Act.*

*Advances for housing and other real estate projects.*

*Escrow funds in banks and trust companies.*

*Securities held by company for guarantee of performance of contracts.*

*Amounts recoverable from insurers.*

*Agents' balances.*

*Bills receivable:*

*Taken for premiums.*

*Not taken for premiums.*

*Funds held by or deposited with ceding reinsurers.*

*Reinsurance recoverage on loss payments.*

*Equipment, furniture, and supplies.*

*Cash advanced to or in hands of officers and agents.*

*Loans on personal security:*

*Original maturity 1 year or less.<sup>1</sup>*

*Long-term debt due in 1 year or less.<sup>2</sup>*

*Long-term debt due in more than 1 year.*

*Other receivables.*

*Miscellaneous:*

*Goodwill and other intangibles.*

*Other miscellaneous assets.*

*Interest, dividends, and real estate income due and accrued:*

*Interest due and accrued.*

*Real estate income due and accrued.*

*Dividends due and accrued.*

*Life insurance premiums deferred and uncollected, etc.*

*Accident and health premiums due and unpaid.*

*Net adjustment in assets and liabilities due to foreign exchange rates.*

*Prepaid real estate taxes.*

*Accrued commitment fees.*

*Federal employees group life conversion pool fund.*

*Total assets.*

#### LIABILITIES AND CAPITAL—LIFE INSURANCE CARRIERS

*Aggregate reserve for life policy reserves:*

*Pension funds.*

*Other life insurance contracts.*

*Aggregate reserve for accident and health policies.*

*Supplementary contracts without life contingencies:*

*Pension funds.*

*Other life insurance contracts.*

*Policy and contract claims—Life:*

*Due and unpaid:*

*Pension funds.*

*Other life insurance contracts.*

*In course of settlement—Resisted.*

*In course of settlement—Other:*

*Pension funds.*

*Other life insurance contracts.*

*Incurred but unreported:*

*Pension funds.*

*Other life insurance contracts.*

*Less: Reinsurance on reported claims.*

See footnotes, p. 835.

*Policy and contract claims—Accident and health:**Due and unpaid.**In course of settlement.**Incurred but unreported.**Less reinsurance on reported claims.**Policyholders' dividend accumulations:**Pension funds.**Other life insurance contracts.**Accident and health policies.**Policyholders' dividends due and unpaid:**Pension funds.**Other life insurance contracts.**Accident and health policies.**Amount provisionally held for deferred dividend policies not included in item.**Premiums and annuity considerations received in advance:**Pension funds.**Other life insurance contracts.**Accident and health policies.**Liability for premium deposit funds.**Surrender values on cancelled policies.**Commission to agents due or accrued.**General expenses due or accrued:**Salaries and wages.**Other general expenses due or accrued.**Taxes, licenses, and fees due or accrued:**U.S. Federal income tax.**Other taxes, licenses, and fees due or accrued.**"Cost of collection" \* \* \* in excess of total loading.**Unearned investment income:**Dividends on stock.**Real estate income.**Interest.**Miscellaneous.**Amounts withheld or retained by company as agent or trustee.**Amounts held for agents' account.**Remittances and items not allocated.**Net adjustment in assets and liabilities due to foreign exchange rates.**Liability for benefits for employees and agents:**Pension funds.**Other life insurance contracts.**Accident and health.**Other liability for benefits for employees and agents.**Borrowed money:**Original maturity 1 year or less.<sup>1</sup>**Long-term debt due in 1 year or less.<sup>2</sup>**Long-term debt due in more than 1 year.**Interest thereon.**Dividends to stockholders declared and unpaid.**Miscellaneous liabilities:**Mandatory security valuation reserve.**Reserve for employee benefit plans:**Pension funds.**Other life insurance contracts.**Accident and health.**Reserve for other employee benefit plans.**Other reserves included in miscellaneous liabilities.**Other miscellaneous liabilities.**Total liabilities except capital.**Special surplus funds.**Capital paid up:**Preferred stock.**Common stock.**Unassigned surplus.**Total capital.**Total liabilities and capital.*

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See footnotes, p. 835.

## LIABILITIES AND CAPITAL—FIRE AND CASUALTY INSURANCE COMPANIES

*Losses.**Loss adjustment expense.**Contingent expenses and other similar charges.**Other expenses (excluding taxes, licenses, and fees):*

- Claim adjustment services—direct.
- Commission and brokerage—direct.
- Allowances to managers and agents.
- Salaries.
- Directors' fees.
- All other expenses.

*Taxes, licenses and fees (excluding Federal and foreign income taxes).**Federal and foreign income taxes.**Borrowed money:*

- Original maturity less than 1 year.<sup>1</sup>
- Long-term debt due within 1 year.<sup>2</sup>
- Long-term debt due in more than 1 year.

*Interest.**Unearned premiums:*

- Accident only.*
- Accident and health.*
- Hospital and medical expenses.*
- Group accident and health.*
- Noncancellable accident and health.*
- All other unearned premiums:
  - Paid by corporations.
  - Paid by partnerships.<sup>3</sup>
  - Paid by nonbusiness institutions.
  - Paid by governments.
  - Paid by individuals.<sup>3</sup>

*Dividends declared and unpaid—stockholders.**Dividends declared and unpaid—policyholders.**Funds held by company under reinsurance treaties.**Amounts withheld or retained by company for account of others.**Unearned premiums on reinsurance in unauthorized companies.**Reinsurance due from unauthorized companies.**Less funds held or retained by company for account of such unauthorized companies.**Excess of bodily injury liability, etc.**Net adjustments in assets and liabilities due to foreign exchange rate.**Other liabilities.**Total liabilities.**Special surplus funds:*

- Mandatory security valuation reserves.*
- Other special surplus funds.*

*Capital paid up:*

- Preferred stock.*
- Common stock.*

*Unassigned funds (surplus).**Surplus as regards policyholders.**Total liabilities, surplus, and other funds.**Memo: Reinsurance receivable from authorized and unauthorized companies.**Unlisted assets.*<sup>1</sup> Include here items due on demand.<sup>2</sup> Include installments on long-term debt coming due within 1 year, and other debt with original maturity of more than 1 year but coming due within 1 year.<sup>3</sup> Joint accounts of husbands and wives, or other members of families living together, should be classified as "individual" and not as "partnership."