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FEDERAL FINANCE: THE PURSUIT OF AMERICAN GOALS

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LETTERS OF TRANSMITTAL

DECEMBER 18, 1980.

To the Members of the Joint Economic Committee:

Transmitted herewith is a staff study, printed separately, and technical papers which together form Volume 6 of the Special Study on Economic Change (SSEC).

Volume 6 is entitled "Federal Finance: The Pursuit of American Goals" and is one of 10 areas on different aspects of the economy published by the SSEC. The SSEC was initiated in 1978 under the direction of the former Chairman of the Joint Economic Committee, Representative Richard Bolling, then Vice Chairman Senator Hubert H. Humphrey, and the former Ranking Minority Member, Senator Jacob K. Javits. It is intended to identify major changes in the economy and to analyze their implications for policymakers. The successful completion of this Study will, I believe, help provide an economic agenda for the United States for the decade of the 1980's.

The views expressed in the technical papers are exclusively those of the authors and do not necessarily represent the views of the Joint Economic Committee or of individual members. The staff study was approved by the Chairman's Special Study Review Committee formed by the Chairman, Representative Bolling, Ranking Minority Member Representative Clarence J. Brown, and Senator Javits.

Sincerely,

LLOYD BENTSEN,
Chairman, Joint Economic Committee.

DECEMBER 15, 1980.

Hon. LLOYD BENTSEN,
Chairman, Joint Economic Committee,
Congress of the United States, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is a staff study, printed separately, and technical papers entitled "Federal Finance: The Pursuit of American Goals," which constitute Volume 6 of the Special Study on Economic Change (SSEC).

The SSEC was initiated under the leadership of former Chairman of the Joint Economic Committee, Representative Richard Bolling, Vice Chairman Senator Hubert H. Humphrey, and former Ranking Minority Member, Senator Jacob K. Javits. The Study is divided into 10 substantive areas, which together chart major changes in the economy and analyze their implications for policymakers. Volume 6 highlights major issues affecting the Federal Budget and its influence on the American economy.

The Federal Budget stands at the center of many of the significant changes which the U.S. economy has undergone in the past decade. The debate over the Federal deficit, tax policies for economic growth, and the public concern with the proliferation of Federal grant-in-aid programs all relate directly to the way the Federal Budget is drawn up and implemented. In fact, developments in Federal Budget policy have gone hand in hand with the growth of post-World War II American affluence—and also with the slowdown in the growth of national affluence which this country has experienced in recent years. This study and the accompanying technical papers examine all these issues to shed new light on a subject that is critical to the Nation's economic health.

It should be understood that the views expressed in the technical papers are exclusively those of the authors and do not necessarily represent the views of the Joint Economic Committee or of individual members. The staff study was approved by the Chairman's Special Study Review Committee formed by the Chairman, Representative Bolling, Ranking Minority Member Representative Clarence J. Brown, and Senator Javits.

Sincerely,

JOHN M. ALBERTINE,
Executive Director, Joint Economic Committee.

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POSTWAR TRENDS IN THE USES OF THE NATIONAL OUTPUT—A GNP BUDGET APPROACH

By Frank C. Ripley

CONTENTS

SUMMARY

The relation of the Federal budget to the national economy has undergone substantial changes in the post-World War II period. One of those changes is in the functional composition of the Federal budget and in the functional composition of total spending in the American economy. This paper examines the nature of those changes, what has caused them, and what further changes we can expect in the next five years. Eight major types of expenditures are isolated: (1) Basic necessities; (2) education and manpower; (3) health; (4) transportation; (5) general government; (6) defense; (7) new housing; and (8) all other.

Large increases in the nondefense functional expenditures have occurred in the last 20 years in the Federal budget at the expense of defense expenditures. If real defense outlays are to increase as planned in the next five years, then intense pressure will be put on nondefense programs. This will result in a sharp break from past shifts in the composition of the Federal budget. For the economy as a whole the next five years will not see such a sharp change in the historical trend in the composition of expenditures. Rather, there simply will be a slowdown in those historical trends. These assertions appear to be true even under optimistic assumptions about the course of employment, real output and inflation in the next five years.

These conclusions are not sensitive to reasonable alternative assumptions about the growth of potential GNP or to small differences in the inflation rate. Rather, the conclusions result from a perceived change in the public attitude towards defense expenditures versus nondefense expenditures and the scarcity of national resources that dictates a hard choice among defense, health, education, transportation, general government, and investment expenditures. That choice is made both by the government sector and by the private sector and

it will dictate a significant adjustment, particularly by the Federal Government.

I. Introduction

In the last 25 years the U.S. economy has changed both its economic priorities and how those priorities are determined. These changes are not apparent from a cursory glance at the Federal Government budget but can only be seen when the spending patterns of the private sector, the Federal Government and the State and local governments are considered as integral parts of the total national output as measured in the national income accounts.

The traditional use of the national income accounts (NIA) has been to analyze the business cycle. In this use the gross national product has become a familiar measure of the state of the economy to a wide variety of public decision makers. In contrast, the analysis of priorities has almost always focused on the composition of the Federal Government budget or the State and local government budget. For example, the amount of resources dedicated to health in the United States is often cited by computing the share of the Federal budget that is allocated to health care. This figure is then compared with the share that is computed for European countries and by this process the United States appears lacking in health care support. It is often the case that Federal and State and local budgets are described by a familiar pie chart of functions and a description of the short- and long-run trends in these budget components.

One contention of this paper is that this is an incorrect way to analyze priorities, particularly in the analysis of long-term changes in priorities. A major shortcoming of this traditional type of priority analysis is that it ignores the influence of private decisions and State and local decisions in changing—compensating, neutralizing, or reinforcing—the priority decisions made by the Federal Government. A second shortcoming is that it does not account for the indirect influences that Federal priority decisions have on the final set of realized priorities. For example, housing subsidy programs in the short run have a small impact on the composition of the Federal budget but they may have a large impact on total housing expenditures by stimulating additional private sector spending for housing. As a result the share of the Federal budget devoted to housing may bear little relation to the share of national output devoted to housing.

Most of these criticisms of traditional priority analysis are academic if the Federal Government provided services—such as national defense—that were available only through the Federal Government budget. However, in the past 25 years the Federal Government has greatly expanded its role both directly and indirectly in the provision of education, transportation and health services. This change means the Federal Government decisions can no longer be viewed in isolation from private and State and local government decisions.

Passage of the Congressional Budget Act reflected the fact that Congress recognized the need for examining systematically the effects of individual program decisions on both the level of the Federal budget and on the level of the economy. GNP budgeting is an extension of this principle in the sense that it attempts to identify the effects of individual program decisions on both the composition of the budget and the functional composition of the national output.

When the historical trends in the functional shares of the national output are isolated, it is evident that striking changes in the composition of the national output have taken place in the last 20 years. The most striking are: (1) a shift away from defense expenditures to nondefense expenditures both in Federal outlays and in the allocation of total national resources; (2) a shift away from direct outlays to indirect outlays in the form of grants and transfer payments; and (3) a shift into education, manpower training, and health expenditures at the expense of defense expenditures. Moreover, this shift in the use of the national output is not always consistent with the shift in the spending priorities that are implicit in the Federal budget. The most striking case of this is the inconsistency between increased Federal direct and indirect outlays for "basic necessities" and the relative decline in the share of GNP, both in current dollar and in constant dollar terms, allocated to "basic necessities."

These shifts in budget priorities and in how the national output is allocated have been so strong in the last 20 years that the trends can continue only with increasing pressures within the American economy. Evidence for the existence of these pressures has developed in the last several years and continues in the fiscal year 1981 budget of the Carter administration. This budget attempts to reverse the decline in real defense expenditures and even to bring about increases in real defense outlays. At the same time this budget makes no significant reductions in nondefense outlays. The projected deficit is held to reasonable proportions only by a very large increase in taxes and a high projected inflation rate.

Changes in the composition of the national output cannot continue without compensating changes—higher taxes, higher inflation rates or lower real growth. It is starkly evident that the 1981 budget priorities are not consistent with the maintenance of high employment, price stability, high real growth, and the attainment of higher real defense outlays along with growth in nondefense programs.

II. The GNP Budget Concept

The GNP budget concept is in principle very simple. It consists of an aggregation of detailed functional spending categories into generally recognized functional aggregates, in contrast to the usual consumption, investment, government, and net exports aggregation. The aggregate functional categories that were chosen in this analysis are:

1. Basic necessities.
2. Education and manpower.
3. Health.
4. Transportation.
5. General government.
6. Defense.
7. New housing.
8. All other.

These are nearly the same categories that were used in Chapter 3, National Priorities and the National Output, "Economic Report of the President," February 1971. They are generally recognizable types of spending except "basic necessities," which are essentially spending on food, housing maintenance, and clothing. A detailed listing of these functional components and their relation to the national income accounts is given below in the appendix. A brief description of each functional component is given here to identify broadly what the components contain.

1. Basic necessities

Primarily private sector expenditures on food and clothing and government purchases from electric utilities and for agriculture and agricultural resources.

2. Education and Manpower

Private expenditures on secondary and university education. In the government sector this is primarily spending for research, the education and training of veterans, and job programs.

3. Health

Primarily private expenditures for medical care and physician's services. In the government sector it includes medicare outlays and outlays on veterans' hospitals.

4. Transportation

Primarily purchases of new autos, tires and air fares in the private sector. In the public sector transportation outlays are for roads, water ways, air transportation and public transit systems.

5. General Government

This function is associated only with the government and not with the private sector of the economy. It includes outlays for general government administration, sanitation, civilian safety and natural resources.

6. Defense

The defense function is also associated only with the government sector. This function is identical to the national income accounts definition of defense except for atomic energy outlays, which are excluded from the defense function. The national income accounts defense category is also conceptually close to the Federal budget's definition with the exception of the timing aspects of defense procurement.

7. New Housing

Expenditures on new housing include both private investment in residential structures and private outlays for mobile homes. This function is the only one which includes an investment component. The government sector purchases include outlays for Department of Defense housing and subsidized housing programs.

8. All Other

The "all other" category contains all of the gross national product either not accounted for by the seven functional categories listed above or not a part of business fixed investment, net exports and changes in inventories. In the case of private spending the "all other" category consists of expenditures on some consumer durables, recreation expenditures such as travel, boats and sporting events. In the case of

government the "all other" category contains outlays for natural resources (forestry and fisheries), revenue sharing outlays, and sewerage grants.

The aggregation of the basic eight functional categories is performed for several sources of demand: The private sector; the Federal sector; and the State and local sector. In addition, the aggregation is made for direct purchases and, in the case of government spending, the aggregation is made for transfers, grants, and subsidies. Consequently, even though there is a relatively small number of functions, there is an extensive categorization of those functions by who spends the money and through what channel—direct purchase, grants, transfers and subsidies—the spending flows.

III. The Uses of the National Output, 1952–77

The allocation of total national output for 10 basic categories and for selected years is given in table 1. The years 1952 and 1977 are included because they represent the longest time period for which the tabulation can be made. The years 1955, 1966, 1969 and 1973 are included in the table because they were periods when the economy was approximately at full employment. Choosing full employment years corrects the underlying data for abnormal spending, such as increases in unemployment insurance programs in cyclical downturns and increased demand for consumer durables during cyclical upturns.

The changes in the allocation of the national output are very marked between 1952 and 1977 and these changes are pervasive throughout the 1952–77 period. Throughout the last 25 years the shares of national output that were allocated to business investment, net exports, housing and transportation have remained virtually unchanged. There were significant declines in both basic necessities and defense; these declines were offset by a rise in the share allocated to education and manpower, health, general government, and the "all other" category.

This basic picture of the allocation of national output is true whether the national output is measured in current dollars or in constant dollars. Table 2 presents the national output and the functional categories measured in constant 1972 dollars. Although the shifts in national output are slightly less in table 2 than in table 1, the shift is still highly significant and follows the same pattern for both current dollar and constant dollar measures.

TABLE 1.—PERCENTAGE DISTRIBUTION OF GNP IN CURRENT PRICES, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total GNP	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	48.0	44.7	38.0	37.0	35.3	35.5
Education and manpower	3.6	4.3	6.4	7.1	7.6	7.8
Health	4.3	4.6	5.9	6.6	7.4	8.5
Transportation	10.0	11.5	11.3	11.3	11.4	11.7
General government	2.3	2.2	2.8	3.1	3.5	3.9
Defense	12.8	9.3	7.9	8.1	5.6	4.9
New housing	5.3	6.0	4.0	4.2	5.2	5.0
Business investment	9.9	11.1	12.7	11.6	11.8	10.9
New exports	.7	.6	.7	.2	.5	−.6
All other	3.2	5.9	10.3	10.9	11.6	12.4

TABLE 2.—PERCENTAGE DISTRIBUTION OF GNP IN CONSTANT 1972 PRICES, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total GNP	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	42.5	42.2	37.0	36.5	33.9	34.8
Education and manpower	4.3	4.9	6.6	7.2	7.6	8.0
Health	4.7	4.8	5.9	6.5	7.7	8.4
Transportation	9.9	10.9	10.4	10.8	11.7	11.3
General government	2.8	2.7	3.1	3.3	3.5	3.8
Defense	15.1	11.1	8.6	8.7	5.6	4.9
New housing	4.7	5.3	3.8	4.1	5.3	5.1
Business investment	9.4	10.5	12.5	11.6	11.9	10.4
Net exports	.8	.7	.4	−.1	.6	.7
All other	5.7	6.9	11.6	11.4	12.3	12.7

The fact that the shifts are less significant in real terms than in nominal terms indicates that inflation was generally higher in those categories experiencing a rapid increase in their relative share of national output. Good examples of this are the education, health, and general government categories. An exception to this is the defense category which experienced a relatively high rate of inflation but had a large decline in its share of national output.

Because the functional breakdown is similar in both current and constant dollars, most of the discussion below will be centered around the nominal measures. A second reason for this focus is that when the functions are measured in real terms, inadequate accounting is made for the growth of productivity in the government sector due to the method of deflation of the government sector used in the national income accounts. The effect of this is to understate the share of defense and general government in real terms. This problem is not encountered when the functions are expressed in nominal terms.

The final composition of the national output results from a variety of forces, some which reinforce and others which act against the historical changes in the composition of national output. This is evident when the spending patterns of two basic sources of demand in the economy are examined. Tables 3 and 4 present the composition of demand for the government sector and for the private sector. In the case of the government, demand is measured as total Federal, State, and local expenditures, which consist of purchases, transfers, and subsidies. It excludes grants-in-aid which are omitted because they represent a within-government transfer.

TABLE 3.—PERCENTAGE DISTRIBUTION OF TOTAL GOVERNMENT EXPENDITURES, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total expenditures	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	13.7	18.5	19.3	21.4	25.9	29.9
Education and manpower	11.5	14.7	19.3	19.2	20.8	20.5
Health	4.0	3.9	5.4	7.4	8.5	9.1
Transportation	6.7	8.1	9.8	8.2	7.4	5.9
General government	14.8	15.6	16.4	16.1	17.8	18.2
Defense	48.9	39.4	29.1	26.9	18.5	15.5
New housing	.5	−.2	.8	.8	1.1	.9
All other	5.0	4.6	5.9	3.7	4.4	4.0

TABLE 4.—PERCENTAGE DISTRIBUTION OF DISPOSABLE INCOME IN CURRENT PRICES, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Disposable income	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	69.2	63.6	54.8	52.7	49.0	48.2
Education and manpower	1.7	1.8	2.5	2.9	2.8	2.9
Health	4.9	5.4	7.0	7.7	8.3	9.8
Transportation	12.4	14.3	13.5	13.8	13.8	14.7
New Housing	7.5	8.8	5.6	6.0	7.3	7.1
All other consumption and saving	4.3	6.1	16.6	16.9	18.7	17.3

In the case of the private sector, total disposable income is either saved or spent on consumer goods and investment in housing. Disposable income is treated as resources available to the private sector with the "all other consumption and saving" category, the residual of disposable income not spent on the six major functions given in table 4. Of course, the private sector spending for general government and defense does not exist and is not included in table 4.

In a sense tables 3 and 4 represent the priorities of the government sector and the private sector. These priorities seem to overlap in the case of education and health but diverge in the case of basic necessities. As in the case of the total GNP budget, both private and government sector spending for transportation and housing are for all practical purposes constant for the last 25 years.

Another way to gauge the contribution of the government to the definition of the final output is to compute the share of Federal Government expenditures (purchases, grants and transfers) allocated to final output for each functional category. Table 3 presents such a tabulation, excluding the general government and defense functions because government provides 100 percent of the output for these two categories. The first line simply presents Federal expenditures as a percent of total GNP. The second line presents total Federal expenditures for basic necessities as a percent of the total GNP allocated to basic necessities. These figures rise spectacularly both because Federal expenditures for basic necessities rose rapidly and because the basic necessities' share of GNP fell substantially between 1952 and 1977. The direct and indirect contribution of the Federal budget to education rose very little over this period while health shows a strong growth.

It is implicitly assumed that the indirect portion of the Federal Government budget (expenditures excluding direct purchases) is spent by their recipients on the same functional category they belong to in the Federal budget. This is a convenient assumption which may not be too inaccurate since many transfer and grant programs are tied to particular types of spending.

In table 6 the State and local government sector is included with the Federal sector. Grants-in-aid were excluded from Federal expenditures since they are a within-government transfer which would produce some double-counting if left in the Federal budget. The major difference between tables 5 and 6 is the marked increase in the level of government education and manpower expenditures as a percent of

total output for that category. In table 6, almost all of the percentages increase through time, reflecting the strong growth in total government spending as a percent of total output.

TABLE 5—TOTAL DIRECT AND INDIRECT FEDERAL GOVERNMENT EXPENDITURES AS PERCENT OF OUTPUT USED, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total expenditures	20.3	16.7	18.3	19.6	19.7	22.0
Basic necessities	5.3	7.4	10.8	13.4	17.3	22.7
Education and manpower	14.4	10.1	10.6	10.9	13.0	16.8
Health	9.0	5.9	10.6	18.7	20.2	21.8
Transportation	4.7	3.7	8.5	7.5	7.7	7.5
New housing	−.3	−1.2	3.8	3.6	5.7	6.2
All other	12.4	9.0	11.9	8.6	10.9	11.4

TABLE 6.—TOTAL DIRECT AND INDIRECT FEDERAL, STATE, AND LOCAL GOVERNMENT EXPENDITURES AS PERCENT OF OUTPUT USED, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total expenditures	27.1	24.5	28.4	30.5	31.0	33.0
Basic necessities	6.8	9.6	14.3	16.9	21.3	25.7
Education and manpower	79.7	79.5	76.8	77.8	81.5	81.7
Health	23.3	20.0	23.3	32.4	34.7	35.1
Transportation	16.0	15.4	19.5	18.7	17.8	15.0
New housing	2.2	−1.1	3.5	3.6	5.3	4.2
All other	15.4	10.7	13.5	10.4	8.5	9.2

IV. Major Determinants of the Composition of the National Output

Sharp changes in the use of the national output, such as the shift from defense and basic necessities to health and education, result both from natural economic forces and from specific policy decisions made by Federal and State and local governments. The typical natural forces are different prices, incomes, and demographic characteristics of the economy. The policy decisions are not only how much the Federal Government or State and local governments allocate to a given function in their budgets but also whether the allocation is through purchases, transfers, grants, or subsidies.

Clearly, there are many other forces that influence the final composition of the national output. However, most of these are probably small relative to the influence of government policy, prices, incomes, and changes in demography. Factors such as changes in interest rates, changes in the income distribution, tax changes, and changes in wealth are not considered here, primarily due to measurement problems and the need to reduce the list of major forces affecting the composition of the national output to a manageable number.

The purpose here is to identify roughly the most important factors behind the shift in the use of the national output without reliance on a complex and detailed model of government and private decision-making and how they influence the national output. Certainly how the composition of final output is determined is a result of a complex set of forces and only a rough approximation of what determines the final composition of output can be made with a simple model.

Tables 7 and 8 summarize how the composition of the Federal budget has shifted in the past 25 years. Table 7 indicates primarily that the Federal Government shifted from defense to all other major functions. Table 8 isolates the shifts within nondefense spending and indicates strong shifts towards basic necessities and health and away from general government and the "all other" category. Education and transportation maintained their shares of nondefense expenditures. These tables primarily highlight the basic final shifts in the Federal budget without regard to the type of Federal expenditure (purchases, transfers, and grants-in-aid).

Tables 9 through 11 break the Federal expenditure totals into their three major components. Each of these tables reflects the priorities implicit in total expenditures except table 11 which gives the breakdown for grants-in-aid. Here, the basic necessities' share actually fell in spite of the Federal Government absorption of a major portion of the State and local government expenditures on welfare. The "all other" category rose substantially due to the adoption of revenue sharing. Another notable characteristic of these tables is the sharp rise in health transfers evident in table 10, primarily due to development of medicare as a major Federal health program.

TABLE 7.—PERCENTAGE DISTRIBUTION OF TOTAL FEDERAL GOVERNMENT EXPENDITURES, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total expenditure	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	13.7	22.6	27.2	28.5	34.4	38.9
Education and manpower	2.7	2.7	3.9	4.1	5.2	6.2
Health	2.0	1.7	3.6	6.5	8.0	8.8
Transportation	2.4	2.8	5.7	4.6	4.9	4.7
General government	11.8	11.9	12.4	11.8	14.1	13.8
Defense	67.3	58.7	46.2	43.6	31.2	25.5
New housing	−.1	−.5	.9	.9	2.2	2.'

TABLE 8.—PERCENTAGE DISTRIBUTION OF FEDERAL NONDEFENSE EXPENDITURE, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Nondefense expenditure	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	42.0	54.7	50.7	50.6	50.0	52.2
Education and manpower	8.3	6.6	7.2	7.2	7.6	8.3
Health	6.2	4.1	6.6	11.5	11.6	11.9
Transportation	7.5	6.9	10.7	8.1	7.1	6.3
General government	36.2	28.9	23.1	21.0	20.5	18.5
Defense	NA	NA	NA	NA	NA	NA
New housing	−.3	−1.1	1.7	1.6	3.2	2.8
All other	23.4	17.0	17.5	10.3	11.2	8.6

TABLE 9.—PERCENTAGE DISTRIBUTION OF FEDERAL GOVERNMENT PURCHASES, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total purchases	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	2.2	4.3	0	3.4	.3	6.4
Education and manpower	.3	.5	1.6	1.4	2.0	2.1
Health	2.1	2.1	3.4	3.6	6.5	6.5
Transportation	1.4	1.0	2.5	2.3	4.0	3.7
General government	6.2	6.1	7.6	6.1	10.4	11.2
Defense	88.0	86.9	84.3	82.8	75.6	69.2
New housing	−.1	−.8	.6	.4	1.3	.9
All other	4.2	4.4	12.5	7.5	7.0	8.3

TABLE 10.—PERCENTAGE DISTRIBUTION OF FEDERAL GOVERNMENT TRANSFERS, BY FUNCTION

	1952	1955	1966	1969	1972	1977
Total transfers	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	47.8	57.6	62.5	55.3	58.3	58.9
Education and manpower	8.6	6.1	1.5	2.8	4.0	3.4
Health	1.2	.4	3.3	11.0	10.1	11.7
Transportation	3.5	3.5	2.9	2.5	2.4	2.0
General government	36.3	29.8	25.9	24.3	20.9	19.7
Defense	2.6	2.6	3.9	4.1	4.1	4.2
New housing	0	0	0	0	.2	.1
All other	15.8	12.0	5.4	3.3	2.4	1.6

TABLE 11.—PERCENTAGE DISTRIBUTION OF FEDERAL GOVERNMENT GRANTS, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total grants-in-aid	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	53.3	52.0	31.6	41.1	44.5	45.4
Education and manpower	19.3	15.7	23.9	21.3	19.6	25.6
Health	4.6	3.4	6.4	6.8	6.5	5.3
Transportation	18.9	23.4	30.2	21.2	15.1	13.0
General government	2.7	3.3	2.2	3.6	6.4	2.9
Defense	.8	1.0	.8	.8	.5	.4
New housing	.3	1.2	4.8	5.2	7.4	7.5
All other	2.0	2.3	2.4	2.1	22.6	15.5

State and Local Government Budget Decisions

Tables 12 through 14 present breakdowns of State and local government expenditures by type of expenditure and by function. These tables are comparable to the Federal tables with the exception of grants-in-aid which are not defined for State and local governments. What is most striking in these tables is the lack of any distinctive trends in table 12, indicating no strong shifts in priorities for State and local governments. The strongest shift is from transportation to education and manpower but even this one is far from spectacular.

Given the shifts in Federal grants-in-aid evident in table 11 one would have to conclude that the Federal priorities implicit in grants-in-aid had little or no effect on the distribution of State and local spending. The introduction of a general revenue source, revenue sharing, and the rise in State and local tax revenues allowed State and local governments to redistribute spending according to their own priorities.

TABLE 12.—PERCENTAGE DISTRIBUTION OF TOTAL STATE AND LOCAL GOVERNMENT EXPENDITURES, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total expenditures	100.0	100.0	100 0	100.0	100.0	100.0
Basic necessities	14.8	13.3	11.4	13.6	15.9	16.6
Education and manpower	34.4	37.8	42.4	41.6	41.5	41.6
Health	9.0	8.2	7.9	8.5	9.1	9.3
Transportation	17.7	18.4	15.9	13.7	10.9	8.4
General government	21.9	21.8	21.4	21.6	22.1	24.0
Defense	.3	.3	.3	.2	.2	.2
New housing	1.9	.2	.6	.7	.4	0
All other	1.2	1.1	1.2	1.1	.9	1.0

TABLE 13.—PERCENTAGE DISTRIBUTION OF STATE AND LOCAL GOVERNMENT PURCHASES, BY FUNCTION

	1952	1955	1966	1969	1973	1977
Total purchases	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	7.9	8.2	8.6	10.0	11.8	13.7
Education and manpower	36.8	39.8	43.6	43.0	43.3	43.0
Health	9.7	8.7	8.3	8.9	9.7	9.8
Transportation	21.1	21.6	18.1	15.5	12.4	9.3
General government	21.6	20.6	20.3	21.4	22.0	23.7
Defense	.4	.3	.3	.3	.2	.2
New housing	2.6	.7	.9	1.0	.6	.3
All other	1.3	1.1	1.2	1.2	1.0	1.0

TABLE 14.—PERCENTAGE DISTRIBUTION OF STATE AND LOCAL GOVERNMENT TRANSFERS, BY FUNCTION

	1952	1955	1966	1969	1972	1977
Total transfers	100.0	100.0	100.0	100.0	100.0	100.0
Basic necessities	75.2	69.5	61.5	67.5	67.7	60.0
Education and manpower	7.0	7.8	13.7	14.5	13.8	17.2
Health	1.1	.9	.4	1.0	1.1	1.4
Transportation	0	0	0	0	0	0
General government	16.6	21.8	24.5	17.1	17.4	21.4
Defense	0	0	0	0	0	0
New housing	0	0	0	0	0	0
All other	0	0	0	0	0	0

Private Sector Decisions—The Influence of Incomes, Prices, and Demography

A rough measure of the price and income elasticities for private sector consumption by functional category is presented in table 15. These elasticities result from simple, ordinary least-squares regressions for the 1952–77 period of real consumption on a time trend, prices and real disposable income. All variables were computed as logarithms and, where demographic factors seemed most appropriate, they were included in an equation. For example, the health equation included population variables for individuals 65 and over, and the education equation included a variable for the school-age population.

These results are roughly what would be expected. The income elasticity of basic necessities is low while the income elasticity for education is high. However, transportation has a peculiarly high income elasticity while housing has a price elasticity with the wrong sign. Clearly the model is incomplete without recognizing the influence of Federal, State, and local government spending on private spending. For example, the low price elasticity for health expenditures probably reflects the fact that in the last 20 years private insurance plans and government medical plans have grown as the major source of funding for private health spending, resulting in lower price sensitivity for medical expenditures.

TABLE 15.—ESTIMATED PRICE AND INCOME ELASTICITIES FOR PRIVATE CONSUMPTION, BY FUNCTION

	Price elasticity	Income elasticity
Basic necessities	−0.16	0.37
Education and manpower	−.55	.95
Health	−.05	.55
Transportation	−.10	2.00
New Housing	.20	1.31

V. A Long-Run Model of the Functional Composition of the National Output

When the functional composition of the national output is developed in the framework of the national income accounts, it is possible to develop a model that predicts changes in the composition of the national output. Moreover, this model can be used in conjunction with forecasts from the standard short-term and long-term forecasting models that are currently in use.

The structure of such a model is similar to the structure of most long-term models:

1. Potential or available output is determined by a production function that relates real output to technical changes, changes in employment, which ultimately are related to labor force and population changes, and changes in the capital stock.

2. Investment is determined as the amount of investment that is required to sustain the projected level of potential output. In fact, gross private domestic investment has not varied much from about 14 percent of the gross national product.

3. Incomes are distributed between the government and the private sector based on the assumed tax system which is subject to policy decisions. Typically, the current legislated tax system with several minor changes is assumed, an assumption which generates considerable tax revenues and government income when long-term forecasts are made.

4. Housing investment is determined by interest rates, the cost of housing, demographic changes in the economy, and possibly by a government policy goal for housing as an additional determinant.

5. The distribution of Federal and State and local government expenditures among functional categories is determined by policy decisions, which in turn may be related to price, income and demographic considerations.

6. Private sector purchases by functional categories are determined primarily by price, income and demographic factors with possible indirect influences from the transfers and subsidies provided by the government and negative indirect influences from the direct purchases of the government.

7. A "GNP gap" may result from the fact that potential output exceeds the projected demands for the output. Typically, this results from the fact that in long-term projections taxes rise rapidly for a given tax structure due to the progressivity of the tax system. The tax increases reduce private spending and, since the Federal and State and local governments usually have not fully committed these tax revenues, a GNP gap appears. This gap will not be actually realized but is available for distribution either in additional government spending or tax reduction. If the gap should happen to be negative, then the total demands exceed available resources and the gap will be reduced by less government spending, tax increases, or possibly a higher inflation rate.

This long-term model can provide the same type of information that the conventional short-term and long-term forecasting models provide. The major difference is that policy goals that are enunciated in terms of the functional categories can now be analyzed. Examples

of such decisions are a goal for new housing starts, a goal for extending college education to more lower-income students, a goal for extending refurbishing the interstate highway system, or a goal for a national health insurance program in which medical outlays per capita would be targeted to grow over some specified time period. Most goals set by the Federal Government either directly or indirectly commit resources to the different functional components of national output and a model such as this one allows policymakers to determine whether their goals are consistent with the expected growth of the economy.

Table 16 presents actual or estimated values for calendar year 1977 and projected values for 1984 under baseline assumptions for the growth of the American economy. These projections are closely comparable with those made by the Council of Economic Advisers in the Economic Report 1980 as well as those made by private forecasters. These projections provide a starting point for comparisons of alternative government policies with regard to the composition of national output.

TABLE 16.—BASIC ECONOMIC ASSUMPTIONS

	Actual 1977	Projected 1984	CEA–OMB 1984
Potential output (billions 1972 dollars)	1,381.6	1,727.0	1,727.0
Unemployment rate (percent)	7.0	5.1	5.1
Real GNP (billions 1972 dollars)	1,340.5	1,664.0	1,664.0
GNP (billions)	1,899.5	4,060.0	4,052.0
GNP deflator (1972=100)	159.3	244.0	243.5
Federal Government (billions dollars NIA basis):			
Receipts	375.3	964.0	955.7
Expenditures	421.7	964.0	N.A.
Deficit	−46.3	0	N.A.

The projections in table 16 are best described as optimistic, particularly with regard to the projected inflation rate. They are consistent with a moderately severe slowdown in 1980–81 and a modest recovery in the economy thereafter. The implications of alternative assumptions are examined below.

The Growth in Aggregate Supply (Potential Output)

The assumed level of potential output for 1984 is identical to that used by the Council of Economic Advisers and the OMB in their projections in the budget for fiscal year 1981. The potential growth rate is in the 3–3.5 percent range and is based on assumptions about labor force participation rates, productivity trends, and the decline in the average work week. The major uncertainty about this assumption is the effect of the large change in energy prices towards making the current capital stock obsolete. If the rapid increases in energy prices continue and the ability of companies to retool their manufacturing facilities to compensate for the higher energy prices is very limited, then potential growth may be much lower than assumed here. Also, the fact that energy prices have risen in discrete steps in the last six years means that the level of potential GNP has not grown at a smooth rate but has changed abruptly with the change in energy prices.

The Target Unemployment Rate

The target unemployment rate has been assumed at 5.1 percent, which under projected demographic assumptions is very close to the historical policy target of 4.0 percent. This is also an optimistic assumption since it implies that either the projected 1980–81 economic downturn will be mild or, if not, a rapid and possibly not sustainable recovery would be made after a sharp downturn. The consequences of alternative target unemployment rates is examined more systematically below.

Real GNP

The real GNP assumption is derived from the unemployment rate assumption, the potential GNP assumption, and Okun's law, which states that every 3 percent change in the GNP gap will result in a 1 percent change in the unemployment rate. Although Okun's law has not performed particularly well recently in short-term forecasting models, it is still a reliable long-term predictor for the unemployment rate if the level of potential GNP is measured reasonably accurately.

Nominal GNP

Perhaps the most difficult assumption in the long-term analysis is the level of nominal GNP given real GNP or, what is the same thing, assuming a particular path for the inflation rate for the years 1980 through 1984. It is possible to make an optimistic assumption of 9 percent to 10 percent per year and then to examine systematically the direct effects of either higher or lower inflation rates on standard components of economic activity such as production, consumer demand, and government finance. Measuring these effects is not simple and the measurements are not highly accurate; however, it is a more simple and more accurate process than measuring a number of indirect effects. For example, a higher rate of inflation and higher taxes may adversely affect potential output by reducing investment and worker incentives. The simple fact is that inflation rates above 10 percent in the U.S. economy are unprecedented in peacetime and for any significant time period. Hence, high assumed inflation rates may result in potentially misleading estimates of alternative government policies. Because this paper does not focus on the effects of high inflation rates *per se*, it optimistically assumes a long-term inflation rate of somewhat under 10 percent on average between the years 1977 and 1984.

Federal Government Finance

Table 16 also presents the baseline projections for the Federal Government budget. Federal receipts are based on scaled-down legislated increases in social security taxes and an income tax reduction of about $40 billion between 1980 and 1984, effectively adjusting personal income tax rates for inflation, induced increases between 1980 and 1984. There is a problem in determining the level of Federal receipts due to indirect business taxes. The windfall oil profits tax is highly uncertain in both its final revenue generation and in how much its revenues are targeted to particular types of spending, such as energy research and development and income supplements for low

income households to counter higher energy prices. It is assumed that indirect business taxes rise by about $35 billion. Since the oil windfall profits tax is treated as an excise tax its payment is a tax deductible business expense and will create lower corporate profits taxes as this excise tax grows.

The deficit in table 16 is assumed to be 0 as a target of economic policy. That means that total Federal expenditures may grow to about $964 billion by 1984.

TABLE 17.—COMPOSITION OF BASELINE FEDERAL GOVERNMENT EXPENDITURES, BY FUNCTION

[Dollar amounts in billions of current dollars]

	Levels		Distribution (percent)		
	1977	1984	1969	1977	1984
Total expenditures	$421.7	$964.0	100.0	100.0	100.0
Basic necessities	164.0	385.8	28.5	38.9	40.0
Education and manpower	26.1	56.9	4.1	6.2	5.9
Health	37.1	86.8	6.5	8.8	9.0
Transportation	19.8	42.4	4.6	4.7	4.4
General government	58.2	125.3	11.8	13.8	13.0
Defense	107.5	260.3	43.6	25.5	27.0
New housing	8.9	20.2	.9	2.1	2.1

Table 17 presents a breakdown of Federal expenditures by seven major functional categories. The projections for 1984 were developed in several ways. A set of time-series-regression equations that related these seven functional categories to their unified budget categories was computed. The match between categories is not exact, nor is the timing exact due to the need to convert from fiscal years to calendar years for the unified budget. Nevertheless, the fits were close, reflecting the simple fact that the NIA and unified budgets are measuring similar functional categories. For the year 1984 the current Federal Government unified budget projections were inserted into the regression equations to yield the predicted national income functional projections in table 17. This method implies that we are essentially assuming the same composition of the Federal budget that the Federal Government did in the budget document for fiscal year 1981.

Table 17 indicates a substantial slowdown in the growth of "basic necessities" expenditures. In general, the projections tend to indicate little or no changes in shares between 1977 and 1984. This is in marked contrast with the sharp changes in shares in the past 20 years.

The Federal Government functional projections in table 17 can be combined with projections for State and local and private spending to yield a complete functional breakdown of the GNP for 1984. This is given in table 18. The projections for the State and local government and the private spending functional components were derived from a simple regression model that combined a time trend with an appropriate measure of income—the State and local tax base and grants-in-aid for the State and local government sector and disposable personal incomes for the private sector. In addition, demographic effects were mportant in some functional categories and where prices were significant for particular funct onal components, they were also used to project State and local government and the private sector expenditures by functional components. The functional prices were projected from

regression equations where the functional prices were related to a log linear trend and to the overall GNP deflator. This procedure assumes that long-term relative prices change at a relatively constant rate and that long-term relative price changes are determined by sectoral differences in productivity changes. This is not a bad hypothesis since historically relative price changes have been closely linked to sectoral productivity changes.

Table 18 indicates that like the Federal budget distribution in table 17 the historical changes in the distribution of the functional components of the GNP will be slowing down. Only the health component continues its strong increase, due primarily to rising incomes and to demographic factors.

TABLE 18.—PERCENTAGE DISTRIBUTION OF GNP IN CURRENT PRICES, BY FUNCTION

	Actual		Projected
	1969	1977	1984
GNP	100.0	100.0	100.0
Basic necessities	37.0	35.3	34.5
Education and manpower	7.1	7.6	7.7
Health	6.6	7.4	9.0
Transportation	11.3	11.4	11.5
General government	3.1	3.5	3.8
Defense	8.1	5.6	5.3
New housing	4.2	5.2	5.1
Business investment	11.6	11.8	11.5
Net exports	.2	.5	.1
All other	10.9	11.6	11.5

Finally, table 19 presents the distribution of private expenditures by selected functional categories as a share of disposable personal income. This table represents a simple rearrangement of table 18 for the private sector and expressed as a share of disposable income. It isolates the fact that except for the case of health the trends in the redistribution of private expenditures have also slowed down considerably.

The projections of the economy and associated spending by function presented in tables 16–19 are intended as a baseline from which comparisons of alternative economic policies or economic assumptions can be made. Sections VI and VII below describe the effects of alternative functional compositions of the Federal budget and of alternative assumptions of potential economic growth and alternative inflation rates.

TABLE 19.—PERCENTAGE DISTRIBUTION OF DISPOSABLE INCOME IN CURRENT PRICES, BY FUNCTION

	Actual		Projected
	1969	1977	1984
Disposable income	100.0	100.0	100.0
Basic necessities	52.7	49.0	48.5
Education and manpower	2.9	2.8	3.0
Health	7.7	8.3	10.5
Transportation	13.8	13.8	14.0
New housing	6.0	7.3	7.3
All other consumption and saving	16.9	18.7	18.7

VI. The Impacts of Alternative Long-Term Federal Policies

Trends in Federal Budget Policies

The Federal budget projections presented in the baseline forecast do not contain massive changes in Federal outlays nor do they assume the introduction of any large new spending programs. Certainly there is no lack of potential demands on the Federal budget. Foremost among these are: (1) a national rationalization of welfare programs; (2) a national health insurance program; (3) Federal commitment of funds to investment in key supply sectors, such as energy, food, raw materials, transport, and research and development; (4) significantly larger increases in real defense outlays; and (5) enlarged commitment of the Federal budget to social security transfer payments and assumption of nursing home and other medical costs for the aged.

Table 20 presents a high-spending alternative to the baseline Federal budget. It includes a significant expansion in transfer payments, due to welfare reform and a fully indexed social security program. It also includes real increases in defense outlays that are $45 billion higher than in the baseline, or approximately a 5 percent higher real growth path. By 1984 total government expenditures are $121 billion higher than in the baseline or approximately 13 percent higher. A glance at table 20 indicates that this higher path results in a rather modest increase in the basic necessities and the defense shares in the Federal budget. It also results in an ahistorically large decline in the shares of other nondefense functional categories in the Federal budget.

TABLE 20.—COMPOSITION OF HIGH FEDERAL GOVERNMENT EXPENDITURES, BY FUNCTION

	Billions of dollars		Percent distribution	
	Baseline 1984	High 1984	Baseline 1984	High 1984
Total expenditures	964.0	1,085.1	100.0	100.0
Basic necessities	385.8	440.0	40.0	40.5
Education and manpower	56.9	56.9	5.9	5.2
Health	86.8	95.0	9.0	8.8
Transportation	42.4	42.4	4.4	3.9
General government	125.3	125.3	13.0	11.5
Defense	260.3	305.3	27.0	28.0
New housing	20.2	20.2	2.1	1.9

When these high Federal expenditure assumptions are factored into a forecast for the total GNP, it is necessary that other components of the GNP adjust to accommodate the increased Federal claim on real resources. Given a fixed goal for the unemployment rate and inflation rates, the primary source of adjustment is the private sector spending; i.e., it is necessary to reduce private consumption or total investment. This can be accomplished by an increase in taxes. However, the increase must be greater than the associated increase in Federal expenditure. The reason for this is that an increase in taxes of $1 reduces private consumption only by about $.95 a reasonable estimate of the long-run marginal propensity to consume. Hence, if the Federal Government chose to meet its baseline unemployment rate and inflation rate goals, and increase its spending, then it must also increase taxes more than proportionally. This would imply a budget surplus in the high expenditure scenario.

Of course, the government could choose to balance the Federal budget on the high expenditure growth path by not increasing taxes sufficiently. This would imply an excess of total claims on the potential GNP, which would be resolved by a higher inflation rate, thus restricting real claims on output. It is also possible that the excess demand would be reduced to zero by a lower unemployment rate, thus increasing aggregate supply and providing the additional real output to satisfy the increased claims by the government on real output.

There are two problems with this last resolution to the problem of excess government demands on real output. One is that it is necessary for the unemployment rate to drop quite substantially because the Federal Government gains resources only at the rate of about 30 cents on the dollar, approximately the marginal tax revenue from a long-term increase in nominal GNP. The rest of the GNP increase goes to the private sector, the State and local government sector and to a small extent to net exports. The other problem is that the lower unemployment rate and increased level of real GNP may be inconsistent with the inflation rate goal.

One point in table 20 is that a move towards substantial increases in transfers and defense outlays does not shift the functional distribution of Federal expenditures at all significantly. Moreover, these increases in transfer payments and real defense expenditures imply substantial imbalances between aggregate supply and aggregate demand. These imbalances require substantial changes in the economy—higher taxes, higher inflation, lower unemployment rates, or possibly a combination of the three—to resolve the imbalance in aggregate supply and demand.

The approximate dimensions of the real output, unemployment rate and tax rate changes required to balance the economy under the higher Federal Government expenditure path given in table 20 is presented in table 21.

TABLE 21.—*Alternative Policy Responses to Balance the U.S. Economy Under High Federal Expenditures, 1984*

[Billions of current dollars]

Option 1: Tax increase policy response:	
Federal expenditure increase	+121
Federal budget tax increase	+127
Federal budget surplus	+6
Reduction in private consumption	−121
Increase in real output	0
Option 2: Higher inflation policy response:	
Federal expenditure increase	+121
GNP deflator increase—percent	5
Federal budget tax increase	+127
Federal budget surplus	+6
Reduction in private consumption	−121
Increase in real output	0
Option 3: Lower unemployment rate policy response:	
Federal expenditure increase	+121
GNP deflator increase	0
Federal budget tax increase	+121
Federal budget surplus	0
Increase in private consumption	+282
Increase in nominal GNP	+403
Lower unemployment rate—percent	3

Each of the three options in table 21 is an extreme case that would probably never be observed. Rather, some combination of the three—higher taxes, higher inflation and a lower unemployment rate—would all take place concurrently in the process of balancing supply and demand. Options 1 and 2 are similar in that they both increase taxes by $127 billion to reduce private consumption demand sufficiently to balance aggregate supply and demand. The first option raises funds by explicit tax increases while the second raises funds through higher inflation rates. Clearly, option 2 is highly reminiscent of the Federal policies followed in the past 10 years.

Option 3 is the extreme case where stimulation of the economy is used to generate the additional real resources required to balance both the Federal budget and aggregate supply and demand. A substantial increase ($403 billion) in nominal GNP is required to balance the economy and the budget because only about 30 cents out of every dollar of GNP increase flows into Federal revenues. The unemployment rate is reduced by 3 percentage points, indicating a very stimulated economy when the Federal government desires both high expenditures and a balanced budget without additional legislated tax rate increases.

The Implications of Alternative Potential Output and Alternative Inflation Rates

Tables 20 and 21 indicate that the baseline Federal budget projection is consistent with a balanced budget, low unemployment rates and a moderately high inflation rate. Substantial increases in nondefense and defense programs can be accommodated, but only with higher taxes, higher inflation or a very low unemployment rate target, possibly leading to excessive inflation rates.

These results are not very sensitive to higher levels of potential GNP. For example, suppose that the real rate of potential GNP growth were 0.5 percent higher than assumed in the baseline. This translates into a nominal GNP that is only $40 billion higher; this creates approximately $12 billion in Federal budget revenues, a rather small number compared with the $120 billion figure for proposed new programs.

Similarly, if the inflation rate were about 1 percent higher per year than in the baseline, about $80 billion in nominal GNP would be generated resulting in a modest $24 billion in additional Federal revenues. It is conceivable that the forecast for the inflation rate is low by as much as 6 percent per year. Under a sustained inflation rate of 16 percent the available resources would be very large—on the order of $150 billion in additional Federal revenues. As mentioned earlier sustained inflation rates on the order of 16 percent would probably create very different behavior on the part of both the private sector and the government sector, largely invalidating these simple comparisons.

VII. Conclusions

The past 25 years have seen a radical shift in the composition of the national output. This shift has been primarily from expenditures on national defense and basic necessities (food and clothing) to health,

education and manpower related expenditures, and general government; the shift is apparent when expenditures are measured in both nominal and in real terms.

The basic causes of this shift are changes in demography and a strong rise in income in the private sector. The public sector has reinforced this shift in all cases except that the strong support given to the basic necessities category by the Federal Government had little or no influence in increasing the share of national output devoted to that sector.

The channels by which the Federal and the State and local governments sought to alter the distribution of the national output also changed significantly across the 1952–77 period. There was a strong shift from direct purchases to indirect influences on the composition of national output in the form of high growth in transfer payments, subsidies and grants-in-aid.

These major past trends in the composition of the Federal budget and of the total GNP will undergo significant changes in the next five years. The trend towards nondefense outlays in both the Federal budget and the GNP will be slowed considerably. This process will probably be accompanied by considerable tension among those programs competing for resources in the Federal budget. This is due to a modest rate of growth of the economy and an associated modest rate of growth of Federal revenues. This conclusion is not particularly sensitive to alternative rates of growth in real output. However, explicit changes in tax rates or very high inflation rates would release large tax revenues and resources to the Federal Government.

Appendix. Data Sources for Functional GNP

The functional components of GNP are all derived from detailed data from the national income accounts. Two tables—table 2.6 (2.7) and table 3.14—account for almost all of the information required to aggregate the national income to functional components. Tables 2.6 and 2.7 provide personal consumption expenditures by type of expenditure for approximately 100 components in nominal and in real terms. Table 3.14 provides government expenditures by type and function. Price deflators for each function were developed from information in tables 2.6 and 2.7. Except in the general government and defense functions, for which deflators are available in the national income accounts, the government functional categories were deflated by the private sector functional deflators. The private sector deflators were constructed from tables 2.6 and 2.7 where there was a direct correspondence between the two tables. Thus, the deflation procedure is only approximate due to the lack of comprehensive deflators for tables 2.6 and 2.7.

The components used to define each functional category are listed below separately for the private sector and for the government sector. Those retrieval codes with an appended "72" are measured in constant dollars and were used to create deflators if a corresponding nominal series without an appended "72" existed.

In general, the descriptions use the same terminology as is used in tables 2.6, 2.7 and 3.14.

Function: Basic Necessities

Private Sector Expenditures

Retrieval code:	*Description*
CNC&A	Clothing and accessories less footwear.
CNCMIL	Clothing for military personnel.
CNCSFTW	Shoes and other footwear.
CNCSFTW72	Shoes and other footwear.
CNCSM&B	Men's and boys' clothing and accessories.
CNCSM&B72	Men's and boys' clothing and accessories.

FUNCTION: BASIC NECESSITIES—Continued

Retrieval code:	*Description*
CNCSW&C	Women's and children's clothing and accessories.
CNCSW&C72	Women's and children's clothing, accessories.
CNCS72	Clothing and shoes.
CNFOOD&TOB	Food and tobacco.
CNFOODAF	Food produced and consumed on farms.
CNFOODFURN&AF72	Food furnished employees plus farm food.
CNFOODOFF	Premise consumption.
CNFOODOFF72	Premise consumption.
CNFOODPRCH	Purchased meals and beverages.
CNFOODPRCH72	Purchased meals and beverages.
CNFOOD72	Food.
CNTLT	Toilet articles and preparations.
CNTLT72	Toilet articles and preparations.
CNTOB	Tobacco products.
CNTOB72	Tobacco products.
CSCA&JO	Other clothing, accessories, jewelry.
CSFNRL	Funeral and burial expenses.
CSOBEAUT	Barbershops, beauty parlors, baths.
CSOBEAUT72	Barbershops, beauty parlors and baths.
CSOCLNGRMT	Cleaning, repair of garments, etc.
CSORPGRMT72	Cleaning and laundering of garments, etc.
CSORPSHOE	Shoe cleaning and repair.
CSORPSHOE72	Shoe cleaning and repair.
CDAPPL	Kitchen, other household appliances.
CDAPPL72	Kitchen and other household appliances.
CDCGT&U	China, glassware, tableware and utensils.
CDCGTU&072	China, glassware, tableware, etc.
CDFM&B	Furniture, mattresses and bedsprings.
CDFM&B72	Furniture, mattresses and bedsprings.
CDFURN72	Furniture, household equipment.
CDHFO	Other durable house furnishings.
CNFUEL	Fuel oil and coal.
CNFUEL72	Fuel oil and coal.
CNMISC	Miscellaneous household supplies, etc.
CNMISC72	Miscellaneous household supplies, etc.
CNSEMI	Semidurable house furnishings.
CNSEMI72	Semidurable house furnishings.
CSHHOPDOM	Domestic service.
CSHHOPDOM72	Domestic service.
CSHHOPE	Electricity.
CSHHOPE72	Electricity.
CSHHOPG	Gas.
CSHHOPG72	Gas.
CSHHOPOTH	Other household operation.
CSHHOPOTH72	Other household operation.
CSHHOPT	Telephone and telegraph.
CSHHOPT72	Telephone and telegraph.
CSHHOPW	Water, other sanitary services.
CSHHOPW72	Water, other sanitary services.
CSHHOP72	Household operation.
CSHOUS	Housing.
CSHOUSAF	Rental value of farm dwellings.
CSHOUSAF72	Rental value of farm dwellings.
CSHOUSNFO	Occupied nonfarm dwellings.
CSHOUSNFO72	Occupied nonfarm dwellings.
CSHOUSNFT	Occupied nonfarm dwellings.
CSHOUSNFT72	Occupied nonfarm dwellings.
CSHOUSO	Other housing.
CSHOUSO72	Other housing.
CSHOUS72	Housing.

Federal, State, and Local Government Expenditures

Old age, survivors, and disability insurance.
Public assistance and relief.
Other social security and special welfare services.
Unemployment insurance.
Veterans' pensions and disability.
Veterans' insurance.
Utilities and sanitation:
  Gas and electricity.
  Water and sewerage.
Agriculture and agricultural resources.

FUNCTION: EDUCATION AND MANPOWER

Private Sector Expenditures

Retrieval code:	*Description*
CSED&RSCH	Private education and research.
CSED&RSCHE&S	Elementary and secondary schools.
CSED&RSCHHI	Higher education.
CSED&RSCHOTH	Other education and research.

Federal, State, and Local Government Expenditures

Education:
  Elementary and secondary.
  Higher.
  Other.
Labor: Other.
Veterans' benefits and services: Readjustment and other.

FUNCTION: HEALTH

Private Sector Expenditures

Retrieval code:	*Description*
CDOOPHT	Ophthalmic and orthopedic goods.
CDOOPHT72	Ophthalmic and orthopedic goods.
CNDRUG	Drug preparations and sundries.
CNDRUG72	Drug preparations and sundries.
CSOMEDDEN	Services of dentists.
CSOMEDDEN72	Services of dentists.
CSOMEDH&S	Private hospitals and sanitariums.
CSOMEDINS	Health insurance.
CSOMEDINSC&H	Medical care and hospitalization.
CSOMEDINSWC	Workmen's compensation.
CSOMEDINSYL	Health insurance (income loss).
CSOMEDOTH72	Other medical care services.
CSOMEDPFNO	Other professional medical services.
CSOMEDPHY	Services of physicians.
CSOMEDPHY72	Services of physicians.
CSOMED72	Medical care services.

Federal, State, and Local Government Expenditures

Health and hospitals.
Veterans'benefits and services: Hospitals and medical care.
Social security and special welfare services: Hospital and supplementary medical insurance.

FUNCTION: TRANSPORTATION

Private Sector Expenditures

Retrieval code:	*Description*
CDAUTON	New autos.
CDAUTOUN	Net purchases of used autos.
CDAUTO72	Autos (new and not used).
CDMV&P72	Motor vehicles and parts.
CDMVOTH	Other motor vehicles.
CDMVOTH72	Other motor vehicles.
CDTTA&P	Tires, tubes, accessories, parts.
CDTTA&P72	Tires, tubes, accessories and other parts.
CNGAS	Gasoline and oil.
CNGAS72	Gasoline and oil.
CSTRANSPI	Purchased intercity transportation.
CSTRANSPIA	Intercity airline transportation.
CSTRANSPIA72	Intercity airline transportation.
CSTRANSPIB	Intercity bus transportation.
CSTRANSPIB72	Intercity bus transportation.
CSTRANSPIO	Other purchased transportation.
CSTRANSPIO72	Other purchased intercity transportation.
CSTRANSPIR	Railway (excluding commutation).
CSTRANSPIR72	Railway (excluding commutation).
CSTRANSPI72	Purchased intercity transportation.
CSTRANSPL	Purchased local transportation.
CSTRANSPLC	Taxicabs.
CSTRANSPLO72	Other local transportation.
CSTRANSPLR	Railway (Commutation).
CSTRANSPLT	Transit systems.
CSTRANSPLT72	Transit systems.
CSTRANSPL72	Purchased local transportation.
CSTRANSUINSN	Insurance premiums less claims paid.
CSTRANSURP	Repair, rental, parking autos, etc.
CSTRANSUTOLL	Bridge, tunnel, ferry and road tolls.
CSTRANSU72	Operated transportation.
CSTRANS72	Transportation services.
CSUSTRVLFOR	Foreign travel by U.S. residents.

Federal, State, and Local Government Expenditures

Transportation:
- Highways.
- Water.
- Railroads.
- Air.

Other commerce and transportation.
Utilities and sanitation: Transit.

FUNCTION: HOUSING

Private Sector Expenditures

Table 1 from the National Income Product Accounts: Fixed Residential Investment.

Federal, State, and Local Government Expenditures

Housing and community development:
- Urban renewal and community facilities.
- Public housing.

FUNCTION: DEFENSE

Private Sector Expenditures

None.

Federal, State, and Local Government Expenditures

National defense:
- Military services and foreign military assistance.
- Other.

FUNCTION: GENERAL GOVERNMENT

Private Sector Expenditures

None.

Federal, State, and Local Government Expenditures

Central administration and management administration:
- Property and records management.
- Personnel management and employment costs.
- Net interest paid.
- Other.

Civilian safety:
- Police.
- Fire.
- Correction.

Natural resources:
- Conservation and development of resources.
- Recreation.

Utilities and sanitation: Sanitation.

Veterans' benefits and services: Administration and other services.

TRENDS IN THE U.S. FEDERAL BUDGET, 1947–78

By Ronald L. Teigen*

CONTENTS

SUMMARY

During the postwar years, the Federal budget has changed noticeably in a number of ways. It has grown considerably relative to the economy; the composition of both spending and revenues has changed quite drastically; and it has moved from a situation of average balance which was characteristic at least well into the 1960's and even up to 1970, to a situation of apparent chronic deficit. This raises a set of interesting questions: To what extent have systematic longrun forces (i.e., trends) been at work in producing this result, as compared to other systematic forces such as adverse business cycle experience, inflation, or ad hoc events such as the Korean and Vietnam situations? Is the present situation the end result of a steadily ongoing process, or have there been discontinuous shifts and changes in the budget structure and its relationship to the economy?

This study attempts to address these and related questions. I have worked with annual data on both versions (unified and NIA) of the budget, and have used a simple statistical structure to separate the shorter run influences on the budget of cyclical phenomena, inflation, and the effects of particular events from the long run factors at work, characterized here as "trend effects". I have found that rather strong trends are at work in a number of budget areas both on the spending and revenue sides. On the spending side, military expenditures (except retirement) are steadily declining both as a share of the budget and relative to the economy. The most strongly upward-trending outlays

*Professor of economics, the University of Michigan. The author gratefully acknowledges support provided by the Research Seminar in Quantitative Economics, Department of Economics, the University of Michigan. The study could not have been done without the extraordinarily competent research assistance provided by David Garman. Much of the paper was written while the author was Richard Merton Visiting Professor at the University of the Saarland, Saarbrücken, Federal Republic of Germany during March–August 1979. It was typed with good spirit and great skill by Frau Barbara Maldener.

are the various transfer categories—income security, health care payments, interest, and so on. On the receipts side, personal income tax and social insurance tax payments are trending upward relative to the economy while indirect taxes have been declining in this regard. Both total expenditures and total receipts are rising significantly relative to the economy. In recent years, the trend rate of increase of taxes has been considerably higher in this respect than the trend rate of spending.

In the process of estimating these trend effects, I have also been able to measure the response of the budget structure and size to the business cycle and to inflation (due to formal or informal indexing). The composition of the budget is affected cyclically most strongly by unemployment compensation and public assistance payments, while its size relative to the economy is also affected cyclically by changes in defense spending and interest payments. Tax revenues are quite sensitive cyclically, with the shares of social insurance and indirect taxes moving countercyclically, the share of corporate taxes showing strong procyclical movement, and the ratios of all of these taxes to the economy moving procyclically. Finally, the rate of inflation has systematic effects on social insurance, personal income, and indirect taxes, and on total receipts relative to the economy; and also affects a number of expenditure categories, particularly interest payments and certain transfers.

In my paper, I present numerical measures of the strengths of these effects. I am also able to evaluate the degree of structural stability we have experienced. In that connection, I conclude that our present position is largely, but not entirely, the consequence of the action of the trends I have described. However, there have been important structural shifts—notably, a sharp increase in interest payments in the mid-1960's, and the introduction in the early 1960's of new welfare programs, notably Medicare and Medicaid. Mostly, however, the structure has displayed considerable stability. In the past several years, the trend effects have been exacerbated by unfavorable cyclical effects, at least in some years; and by the effects of inflation on certain expenditure categories. The paper concludes with some comments on the implications of all of this for policy.

1. Introduction

The one-third of a century which has elapsed since the end of World War II has seen considerable change in the size of the Federal budget, relative to the U.S. economy, and in the internal composition of budget spending and tax receipts (and their relation to each other as well). In 1947, Federal spending (as measured by the national income accounts (NIA) version of the budget) was $29.8 billion, and tax revenues totalled $43.2 billion; these figures are respectively 12.8 percent and 18.6 percent of the 1947 gross national product (GNP) of $232.8 billion. In the 1947 budget, purchases of current output constituted 43 percent Federal spending (the other 57 percent was transfer payments, with net interest plus transfers abroad representing 20 percentage points out of these 57). On the receipts side, corporate income taxes plus indirect taxes made up the same fraction—43 percent—of revenues.

Between 1947 and 1978, current-dollar GNP grew at a compound annual rate of 7.36 percent. But Federal expenditures grew at 9.23 percent, while revenues rose at a 7.70 percent rate. As compared with

the budget surpluses of the late 1940's, the Federal budget was in continuous and considerable deficit in the 1970's. In 1978, spending had become 21.4 percent of GNP, while receipts were 19.6 percent. Further, the budget's composition differed markedly from what it had been in the early postwar years. Purchases of new output were just one-third of total expenditures instead of 43 percent, and the share of net interest plus foreign transfers fell to 8.5 percent; while on the receipts side the share of corporate and indirect taxes had fallen 20 percentage points, to 23 percent. Their places were taken mostly by rapidly growing domestic transfer and welfare programs, on the outlay side; and by social insurance taxes, on the receipts side.

These are dramatic changes with far-reaching consequences. To discover their ultimate causes would require a socioeconomic analysis of depth and scope far beyond the resources available for the present study. Rather, this paper has a relatively modest aim: to sort out and quantify the immediate sources of change in the composition and size of the budget. The statistics just cited show that the Federal budget has grown rapidly, that outlays have increased at a faster rate than revenues, and that, at the same time, the composition of both spending and receipts has been altered markedly. But these statistics were calculated from figures for 1947 and 1978 only—the two endpoints of the period we are examining. The question addressed here essentially is: How did we move from 1947 to the present? In particular, was our position in 1978 the result of a set of trend movements in the budget and its components, movements which dominated all other influences? Or could the cited figures mainly be due to the economy being at different positions in a cyclical process in 1978 as compared with 1947—with the Federal budget sensitively reflecting these differences? Or are still other forces—particular ad hoc events, inflation—responsible for our postwar budget history? Answers to these questions are important because they bear on our basic view of the budget and the function or functions it performs. Thus if we were to find, for instance, that cyclical forces have been the most prominent influences on the budget from 1947 to the present, it might be suggested that budget movements have largely been passive responses to more basic forces emanating from the economy; i.e., we might conclude that most of the observed movement arose from the budget playing its "automatic stabilizer" role in a growing economy. The immediate question then might be whether more-or-less cyclical sensitivity ought to be built into the budget, or whether the existing configuration best balances countercyclical considerations against other issues, such as the proper size of government. But if instead it is found that trends have dominated budget movements since 1947, a much different set of issues—focused most immediately on the proper size and composition of government spending and taxing, income distribution, incentives, etc.—seems paramount.

The goal of this study, then, is to disentangle from one another, and from random influences, the various systematic forces which have been associated with movements in the Federal budget, using annual data over the period 1947–78. Both unified and NIA budget data are scrutinized, using a simple, uniform analytical framework. As a prelude to this formal statistical analysis, I examine the year-to year movements in budget spending and receipts, and their components, with

some care. Some of the results of this descriptive work are later used in the process of specifying the formal analytical structure.

This discussion of budget developments over the period studied constitutes the next section of the paper. In Section 3, the statistical model is explained and the results of the statistical analysis are presented and discussed. The study's conclusions are found in Section 4. The detailed numerical results, as well as a list of symbols and an outline of the organizational plan followed in the paper, are in the Appendix.

2. Federal Budget Developments, 1947–78

The receipts and expenditures of the Federal government are summarized in two somewhat different budget frameworks. One is the unified budget, the version used by the Office of Management and Budget, the Treasury, and other Federal agencies in making operating plans and reporting results. Accordingly, it is considered the "official" budget structure. The other is the national income accounts (NIA) budget, the version already mentioned above and the one which is consistent with the definitions and assumptions used in constructing the national income and product accounts. These two budget formats differ most importantly in the conventions followed as to the point in time at which expenditures and receipts are to be recorded in the budget; as to whether to include Federal government lending programs (the unified budget includes them; the NIA budget does not); and as to whether Federal employee retirement plans should show up as an explicit budget item (the NIA budget includes these both as expenditures and receipts; the unified budget nets them out as being an intragovernmental transaction; hence this particular difference affects the relative size of the two budgets, but does not cause the recorded surplus or deficit to differ between them).[1]

In this study, data from both of these budget formats will be analyzed. The chief reason for using information for both budgets is that a different set of details is available in each one. Thus, unified budget outlays are broken down into seventeen functional subtotals (plus a negative receipt item, "undistributed offsetting receipts") and then into further detail within each subtotal, to that a great deal of program-specific detail is available in this format (though not for the entire postwar period). On the other hand, because NIA budget categories and data are consistent with the national income accounts, the NIA budget is the best one to use in evaluating the relationship between the economy and the budget. However, the data are divided into fewer and more inclusive categories on both the spending and receipts sides of the budget.

a. Total Receipts, Spending, and Cumulative Position

Let us begin our descriptive analysis by examining developments in the levels and growth rates of spending and taxing and in the surpluses and deficits as measured by the two budget concepts over the

[1] See e.g. D. J. Ott and Attiat F. Ott, "Federal Budget Policy," 3rd ed. (Washington, D.C.: The Brookings Institution, 1977); chapter 2, for a more detailed statement of the differences between the unified and the NIA budgets.

period 1947–78. Annual Federal budget receipts, spending, and surpluses or deficits are given in table 1 for this period, and these data are plotted in figure 1. To facilitate comparison, data for both budgets are given on a fiscal year basis in table 1 and figure 1, although in the remainder of this study we use calendar-year data for the NIA concept and fiscal-year data for the unified budget, since this is the form in which the detailed data on budget subcategories are available.

TABLE 1.—FEDERAL BUDGET RECEIPTS, SPENDING, AND SURPLUS OR DEFICIT, 1947–78

[Dollar amounts in billions]

	Unified budget concept				National income accounts budget concept				
Fiscal years [1]	Total receipts	Total outlays	Surplus or deficit (−)	Cumulative surplus or deficit (−)	Total receipts	Total expenditures	Surplus or deficit (−)	Cumulative surplus or deficit (−)	Federal debt held outside the Federal Government and Federal Reserve System [2]
1947	$38.4	$34.5	$3.9	$3.9	$42.7	$29.5	$13.2	$13.2	$200.1
1948	41.8	29.8	12.0	15.9	43.6	30.9	12.7	25.9	192.2
1949	39.4	38.8	.6	16.5	40.0	39.6	.4	26.3	198.9
1950	39.5	42.6	−3.1	13.4	42.0	42.4	−.5	25.8	196.8
1951	51.6	45.5	6.1	19.5	60.8	44.6	16.2	42.0	193.4
1952	66.2	67.7	−1.5	18.0	65.2	66.0	−.8	41.2	196.9
1953	69.6	76.1	−6.5	11.5	69.4	75.9	−6.5	34.7	201.0
1954	69.7	70.9	−1.2	10.3	65.8	74.3	−8.5	26.2	197.0
1955	65.5	68.5	−3.0	7.3	67.4	67.2	.2	26.4	200.3
1956	74.5	70.5	4.0	11.3	76.3	70.0	6.3	32.7	195.5
1957	80.0	76.7	3.3	14.6	81.0	76.0	5.0	37.7	194.0
1958	79.6	82.6	−3.0	11.6	78.1	82.8	−4.7	33.0	195.1
1959	79.2	92.1	−12.9	−1.3	85.4	91.2	−5.8	27.2	204.2
1960	92.5	92.2	.3	−1.0	94.8	91.3	3.4	30.6	204.6
1961	94.4	97.8	−3.4	−4.4	95.0	98.1	−3.1	27.5	205.9
1962	99.7	106.8	−7.1	−11.5	104.0	106.2	−2.2	25.3	212.5
1963	106.6	111.3	−4.7	−16.2	110.0	111.7	−1.7	23.6	216.1
1964	112.7	118.6	−5.9	−22.1	115.6	117.2	−1.5	22.1	216.6
1965	116.8	118.4	−1.6	−23.7	120.0	118.5	1.4	23.5	215.4
1966	130.9	134.7	−3.8	−27.5	132.7	132.7	0	23.5	211.5
1967	149.6	158.3	−8.7	−36.2	146.0	154.9	−8.9	14.6	204.4
1968	153.7	178.8	−25.1	−61.3	160.0	172.2	−12.2	2.4	217.0
1969	187.8	184.5	3.3	−58.0	190.1	184.7	5.4	7.8	214.0
1970	193.7	196.6	−2.9	−60.9	194.9	195.6	−.6	7.2	217.2
1971	188.4	211.4	−23.0	−83.9	192.5	212.7	−20.2	−13.0	228.9
1972	208.6	232.0	−23.4	−107.3	213.5	232.9	−19.5	−32.5	243.6
1973	232.2	247.1	−14.9	−122.2	240.5	256.2	−15.7	−48.2	258.9
1974	264.9	269.6	−4.7	−126.9	271.8	278.8	−7.0	−55.2	255.6
1975	281.0	326.1	−45.1	−172.0	283.5	328.7	−45.3	−100.5	303.2
1976	300.0	366.4	−66.4	−238.4	313.9	371.5	−57.6	−158.1	376.4
Transition quarter	81.8	94.7	−12.9	−251.3	83.9	96.6	−12.7	−170.8	----------
1977	357.8	402.7	−44.9	−296.2	365.3	412.0	−46.7	−217.5	438.6
1978	402.0	450.8	−48.8	−345.0	413.8	450.6	−36.8	−254.3	488.3

[1] In this tabulation, receipts and spending are shown on a fiscal year basis for both budget concepts. However, in the remainder of this study the NIA budget data are on a calendar year basis, as most data on budget details are available in that form.

[2] As of the end of the calendar year through 1953, and as of the end of the fiscal year thereafter.

Source: "Economic Report of the President" (Washington: U.S. Government Printing Office), various issues.

There is much interest in table 1 and figure 1. Looking first at table 1, there is a column headed "cumulative surplus or deficit" for each of the two budget statements. To derive the data in these columns, I have simply begun at 1947 (arbitrarily taking the cumulative budget balance at that point to be zero; i.e., "letting bygones by bygones") and added each year's surplus or deficit figure to the cumulant of the preceding years from 1947 on.

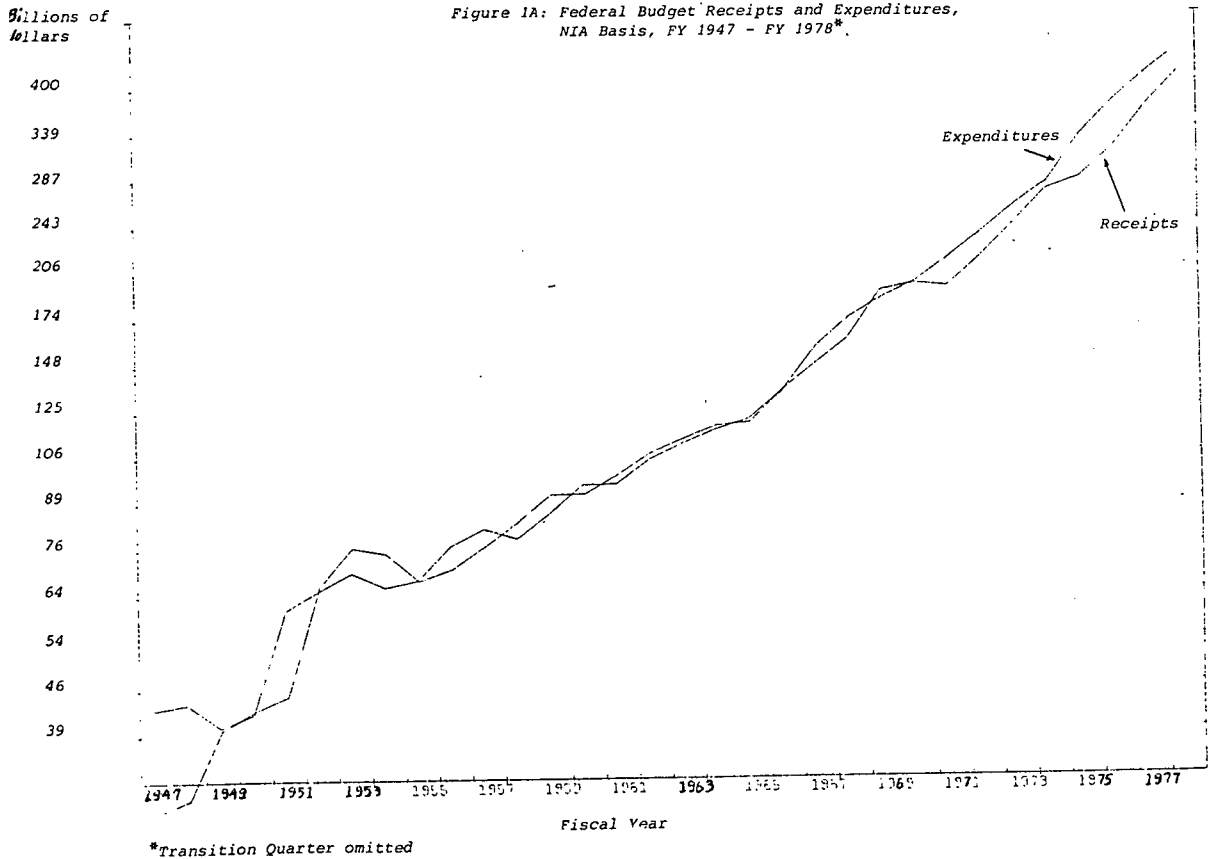

Figure 1A: Federal Budget Receipts and Expenditures, NIA Basis, FY 1947 - FY 1978*.

*Transition Quarter omitted

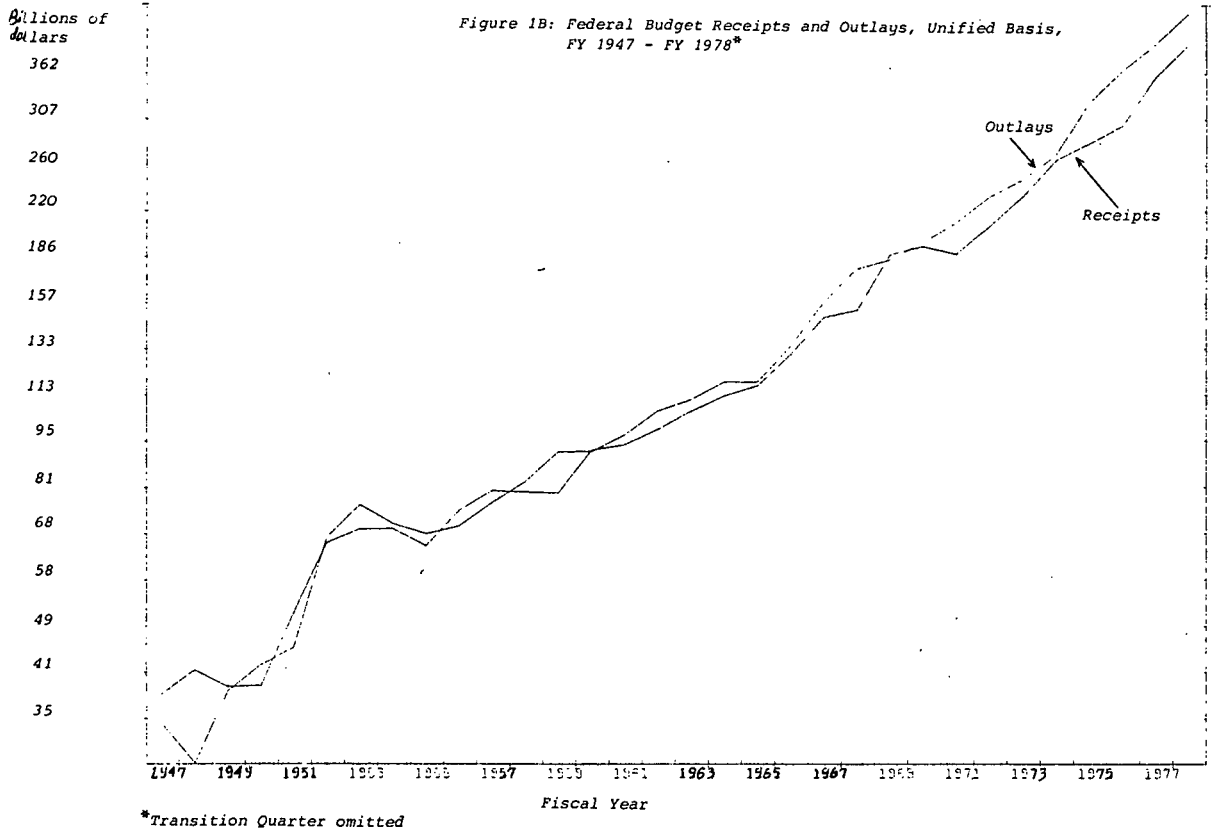

*Figure 1B: Federal Budget Receipts and Outlays, Unified Basis, FY 1947 - FY 1978**

**Transition Quarter omitted*

Two extraordinary facts about the budget are immediately noticeable. The first concerns the years from FY 1947 into the 1960's. Where there were of course individual years of deficit mixed in with years of surplus in the earlier part of the 1947–78 period, the budget was in cumulative balance until well into the 1960's, starting from 1947. In fact, the NIA version of the budget displayed a cumulative surplus continuously until fiscal year 1971. Even if we begin this tabulation in fiscal year 1949 (on the ground that fiscal years 1947 and 1948, years of rather large surpluses, were atypical), the NIA budget was for all practical purposes in cumulative balance until the mid-1960's. The unified budget showed a cumulative deficit as early as fiscal year 1959, but this deficit did not begin to increase with any rapidity until fiscal year 1962 or thereabouts.

The last column of table 1 shows the amount of interest-bearing Federal debt held outside the Federal government and Federal Reserve System as of the end of each year. It is remarkable that, at the end of fiscal year 1970, this amount was $217.2 billion—an increase of only $17.1 billion during the whole 23-year period since 1947, and a symptom of the fact that the budget basically was in cumulative balance during that period.[2]

While the cumulative data show the NIA budget to have been in long-run balance until fiscal year 1971, a somewhat different picture emerges from the unified budget figures, as we have already noted. As of fiscal year 1970 the cumulative surplus or deficit differs by $68.1 billion between the unified and NIA budgets, with the unified budget showing a $60.9 billion cumulative deficit and the NIA budget still in cumulative surplus by $7.2 billion. What accounts for this rather large difference?

We have already observed that, as regards surpluses and deficits, the two budgets differ in timing and in coverage. As to timing, the differences should largely disappear as a longer and longer period is considered. The significant difference in coverage, as far as budget balance or imbalance is concerned, involves Federal credit programs. The rising unified budget cumulative deficit in the 1960's must be due largely to the expansion of Federal lending, because new loans showed up as current outlays in the unified budget. In a sense, this difference between the two budgets also is one of timing. As these lending programs mature, and to the extent that the loans made under them are sound, repayment flows will rise; and, since repayments are recorded as current unified budget receipts, the lending programs will cause the unified budget to move toward surplus at some piont in time (other things equal), thus offsetting the expanding deficit which was a consequence of these programs' early years.

In summary, the first striking fact is that the Federal budget can be said to have been roughly in longrun balance or close to it, under a reasonable definition, at least well into the 1960's. But the second striking fact is the rapidity and degree of change in this situation in the subsequent years. During the 1970's, both budgets show deficits each year (except for the NIA budget in fiscal year 1970), and in most

[2] Of course, the story is slightly more complicated than this. During much of this period, the budget was in cumulative deficit on a cash basis (neither of the budgets discussed in this study is a "cash budget" in the sense that its "bottom line" is a precise measure of the amount of financing needed for the period covered). Some of the cash deficit was financed by selling securities to the public which they held (note that debt held by the private sector did increase by about $17 billion by the end of fiscal year 1970) and some was monetized as the Federal Reserve System increased its holdings of U.S. Government securities by $39.5 billion between 1947 and 1970, increasing the private sector's holdings of another form of government debt—high-powered money—in the process.

years the deficits are very large ones in comparison to prior experience during the postwar period. As of the end of fiscal year 1978, the cumulative deficit was $345 billion in the unified budget accounts, and $254.3 billion under the NIA concepts. Symptomatically, the Federal debt held outside the Federal government and Federal Reserve System has precisely doubled in the last six years of the period, rising from $243.6 billion at the end of fiscal year 1972 to $488.3 billion at the end of fiscal year 1978.

These contrasts set the theme for some of the particular issues examined in the remainder of this paper. Before the turn of the decade, there was (roughly) budget balance; since the 1970's began, however, the budgets have been in continuous and considerable deficit. It is natural to ask: Did some change occur in the structure of the budget itself or in the relationship of the budget to the economy at or about the turn of the decade, which has led to this dramatic change in the condition of the Federal budget? Or has the general structure of the budget itself and of the budget's relationship to the economy remained essentially unchanged, with the growing cumulative deficit mostly reflecting changes in the economy that are responsible for the deterioration in the budget balance? Or has the budget's structure and so on remained unchanged, with present circumstances largely the result of longrun forces within the budget itself? These are questions which I shall try to address in the next section of this paper.

b. Spending and Tax Programs, 1947–78

As a basis for the statistical work which is discussed in that section, let us examine movements of the budgets and their components over particular subperiods of the 1947–78 era, looking first at figure 1 showing annual total spending and receipts for each of the two budget concepts. The vertical axis in this figure is scaled in logarithms; this means that data which plot as a straight line display a constant rate of growth.[3] From our examination of the data plotted in this figure, it appears that the fiscal year 1947–fiscal year 1978 period can be divided into several subperiods, each differing from the ones around it in terms of rates of growth of spending and revenue collection. First, there were changes on both sides of the budget at the beginning of the Korean war, so that fiscal year 1947–fiscal year 1951 is treated as a subperiod which ends at the onset of action in Korea. Budget growth faltered in fiscal year 1953 and fiscal year 1954, but resumed in fiscal year 1955. Therefore I have chosen to consider fiscal year 1951–fiscal year 1955 as a second subperiod, although there are obvious changes in growth rates within this span of years. Beginning in fiscal year 1955, spending and revenues grew at quite steady rates for the next ten years, until the Vietnam involvement pushed budget growth sharply upward; this gives a third subperiod consisting of fiscal year 1955–fiscal year 1965. The expansion which began in fiscal year 1965 continued until fiscal year 1969, at which time a substantial reduction in budget growth occurred, especially on the receipts side of the ledger, lasting until fiscal year 1974. After 1974, inflation and recession tilt the budget growth lines upward again, and both revenues and spending grow rapidly for the final four years in our analysis. Thus we have

[3] A rising line indicates a positive rate of growth; an absolutely horizontal line means zero growth; and a downward-sloping line indicates negative growth. The steeper the line, the greater the rate of growth. If a line curves upward, the growth rate is rising (or falling more slowly) as time passes; if it curves downward, the growth rate is falling (or rising less rapidly).

identified three final subperiods consisting of the fiscal years 1965–69, 1969–74, and 1974–78.

Following is a summary tabulation of growth rates of spending and revenues under each budget for these subperiods:

TABLE 2.—COMPOUND ANNUAL GROWTH RATES, FEDERAL BUDGET RECEIPTS AND SPENDING, FISCAL YEARS 1947–78 AND SELECTED SUBPERIODS

[In percent]

Fiscal years	Unified budget		NIA budget	
	Receipts	Outlays	Receipts	Expenditures
1947–51	7.69	7.16	9.24	10.89
1951–55	6.11	10.75	2.61	10.79
1955–65	5.96	5.63	5.94	5.84
1965–69	12.60	11.73	12.19	11.73
1969–74	7.13	7.88	7.41	8.58
1974–78	10.31	12.86	10.40	11.96
1947–78	7.80	8.57	7.54	9.12

Note: The unified budget growth rates correspond to those shown for total receipts and spending in table 3 below, while the NIA budget growth rates do not correspond exactly to those shown in that table. This is because the NIA budget data in table 3 are based on calendar years rather than fiscal years.

Having identified these subperiods, we next examine movements in the various components of the budget within this framework. Detailed data on beginning-of-subperiod budget shares and within-subperiod growth rates for spending and tax subcategories under each budget format are found in tables 3a–3d. In reading the data in these tables it should be borne in mind that the share of a particular spending or tax subcategory will rise over some period if that subcategory grows more rapidly than the whole budget; but if it grows more slowly, the share will fall. In fact a considerable shift occurred in the distribution of spending among programs between 1947 and 1978, as well as in the size of the whole budget. And superimposed on these apparent trend movements is the pattern of shorter term accelerations and decelerations that delineate the subperiods.

We look first at the spending side of the budgets. The broad outlines of the changes that have occurred can easily be seen in the NIA expenditure figures, where total spending is broken down into just a few subcategories (Table 3a); these changes were already summarized in the Introduction above. In this budget, total expenditures are broken down into purchases and transfers. Over 1947–78, both of the purchase categories—defense and nondefense—grew more slowly than total expenditures, so that purchases have fallen as a fraction of the budget while transfers have risen. The two transfer categories that have grown most rapidly are grants-in-aid to State and local government, which has experienced a compound growth rate of 12.96 percent per year since 1947; and domestic transfer payments to persons, which grew at a 10.26-percent rate. These two items comprised 56 percent of NIA expenditures in 1978.

Table 3b provides detailed breakdowns by function of unified budget outlays in the period fiscal year 1948–fiscal year 1978.[4] In fiscal year 1948, programs related to national defense constituted 26.3 percent of total unified budget outlays and was the largest single category, approached only by veterans benefits and services, which amounted to 21.7 percent (these are respectively Functions 050 and 700 in the unified budget).

[4] For unified budget breakdowns into the 17 major outlay categories, or functions as they are called, data are available only beginning with fiscal year 1948. For further breakdowns into subfunctions, data are available beginning only with fiscal year 1962.

TABLE 3a.—SHARES OF TOTAL EXPENDITURES AND GROWTH RATES OF FEDERAL EXPENDITURES BY BUDGET CATEGORY, NATIONAL INCOME ACCOUNTS BUDGET, SELECTED CALENDAR YEARS, 1947–78

[In percent]

Expenditure category	Percent of total expenditures, 1947	Compound growth rate, 1947–51	Percent of total expenditures, 1951	Compound growth rate, 1951–55	Percent of total expenditures, 1955	Compound growth rate, 1955–65	Percent of total expenditures, 1965	Coumpond growth rate, 1965–69	Percent of total expenditures, 1969	Compound growth rate, 1969–74	Percent of total expenditures, 1974	Compound growth rate, 1974–78	Percent of total expenditures, 1978	Compound growth rate, 1947–78
Defense purchases of goods and services	30.3	38.71	58.0	3.51	56.4	2.55	39.9	11.43	40.5	0.19	25.7	6.64	21.6	8.04
Nondefense purchases of goods and services	12.3	7.04	8.3	5.60	8.8	11.50	14.4	4.43	11.2	9.97	11.4	12.44	11.8	9.09
Domestic transfer payments to persons	29.5	—.65	14.8	9.66	18.2	9.34	24.5	13.69	26.8	17.73	38.2	12.28	39.4	10.26
Foreign transfer payments	6.5	12.29	5.4	—9.82	3.0	.59	1.8	—1.47	1.1	9.65	1.1	1.87	.8	1.90
Grants-in-aid to State and local governments	5.9	9.33	4.3	5.95	4.6	13.42	9.0	16.36	10.8	16.64	14.7	14.92	16.6	12.96
Net interest paid	13.7	2.08	7.7	.84	6.7	6.26	6.8	11.21	6.8	10.19	7.0	14.20	7.7	7.23
All other [1]	1.8	12.31	1.5	14.42	2.2	11.80	3.7	3.13	2.7	2.31	1.9	13.20	2.1	9.64
Total expenditure		17.96		4.19		6.16		11.08		9.70		11.40		9.23

[1] Subsidies less current surpluses of Government enterprises plus wage disbursements less accruals.

TABLE 3b.—SHARES OF TOTAL OUTLAYS AND GROWTH RATES OF FEDERAL OUTLAYS BY BUDGET CATEGORY, UNIFIED BUDGET, SELECTED FISCAL YEARS, 1948–78

[In percent]

Outlay category	Percent of total outlays, 1948	Compound growth rate, 1948–51	Percent of total outlays, 1951	Compound growth rate, 1951–55	Percent of total outlays, 1955	Compound growth rate, 1955–65	Percent of total outlays, 1965	Compound growth rate, 1965–69	Percent of total outlays, 1969	Compound growth rate, 1969–74	Percent of total outlays, 1974	Compound growth rate, 1974–78	Percent of total outlays, 1978	Compound growth rate, 1948–78
050 National defense	26.3	40.73	48.0	16.81	58.1	1.77	40.1	13.73	43.0	−0.42	28.8	7.36	23.3	8.96
150 International affairs	15.3	−7.31	8.0	−11.65	3.2	8.96	4.4	−3.37	2.5	4.43	2.1	.98	1.3	.86
250 General science, space and technology		270.84	.1	9.75	.1	54.73	4.9	−3.66	2.7	−4.54	1.4	4.23	1.1	32.29
270 Energy	1.0	9.46	.8	−4.02	.5	7.49	.6	10.60	.5	−3.52	.3	58.08	1.3	10.42
300 Natural resources and environment	2.6	18.87	2.9	−7.96	1.4	10.38	2.1	3.08	1.5	14.76	2.1	16.69	2.4	9.12
350 Agriculture	.2	(1)	−.7	(1)	5.1	1.17	3.3	9.99	3.1	−17.36	.8	34.02	1.7	16.88
370 Commerce and housing credit	1.0	59.09	2.7	−47.05	.1	28.44	1.0	−17.24	.3	49.08	1.5	−3.83	.7	8.22
400 Transportation	2.6	6.70	2.1	6.85	1.8	16.54	4.9	3.20	3.5	7.03	3.4	13.04	3.4	10.34
450 Community and regional development	.3	−15.54	.1	27.96	.2	23.68	.9	10.01	.8	21.44	1.5	26.28	2.4	17.77
500 Education, training, employment and social services	.6	7.15	.5	17.31	.7	16.99	1.8	37.03	4.1	10.37	4.6	19.65	5.9	17.71
550 Health	.5	25.86	.7	−2.57	.4	19.92	1.5	60.09	6.4	13.42	8.2	17.42	9.7	20.32
600 Income security	9.8	16.42	10.2	18.58	13.3	10.90	21.7	9.70	20.2	17.76	31.3	13.79	32.4	13.80
700 Veterans benefits and services	21.7	−5.06	12.1	−4.09	6.8	2.04	4.8	7.49	4.1	11.87	5.0	8.55	4.2	3.63
750 Administration of justice	.6	8.64	.5	4.10	.4	7.53	.4	9.52	.4	26.47	.9	10.77	.8	10.82
800 General government	3.4	1.07	2.3	−15.69	.8	10.62	1.2	3.09	.9	14.86	1.2	3.26	.8	4.42
850 General purpose fiscal assistance	.1	18.26	.1	28.71	.2	7.27	.2	15.94	.2	74.60	2.6	8.12	2.1	21.58
900 Interest	17.1	2.99	12.2	2.07	8.8	5.56	8.7	11.12	8.6	12.16	10.4	11.17	9.8	7.39
950 Undistributed offsetting receipts	−3.3	6.39	−2.6	3.26	−2.0	8.80	−2.7	15.08	−3.0	24.60	−6.2	−1.27	−3.5	9.57
Total outlays		15.22		10.75		5.63		11.73		7.88		12.86		9.40

[1] Not def.

TABLE 3c.—SHARES OF TOTAL TAXES AND GROWTH RATES OF FEDERAL TAXES BY TAX CATEGORY, NIA BUDGET, SELECTED CALENDAR YEARS, 1947–78

Tax category	Percent of total receipts, 1947	Compound growth rate, 1947–51	Percent of total receipts, 1951	Compound growth rate, 1951–55	Percent of total receipts, 1955	Compound growth rate, 1955–65	Percent of total receipts, 1965	Compound growth rate, 1965–69	Percent of total receipts, 1969	Compound growth rate, 1969–74	Percent of total receipts, 1974	Compound growth rate, 1974–78	Percent of total receipts, 1978	Compound growth rate, 1947–78
Personal income tax	45.4	7.40	40.7	4.73	43.3	5.55	43.4	15.14	48.1	6.69	45.4	10.18	44.8	7.65
Corporate income tax	24.7	19.40	33.7	−.70	29.0	3.21	23.2	5.80	18.4	4.86	15.9	11.73	16.6	6.33
Indirect business taxes	18.0	4.67	14.6	3.36	14.7	4.44	13.3	3.60	9.6	2.70	7.5	6.48	6.5	4.20
Contributions for social insurance	11.9	8.57	11.1	7.13	12.9	10.31	20.1	17.06	23.8	13.87	31.1	11.45	32.2	11.23
Total receipts		10.43		3.08		5.53		12.19		7.94		10.57		7.70

TABLE 3d.—SHARES OF TOTAL TAXES AND GROWTH RATES OF FEDERAL TAXES BY TAX CATEGORY, UNIFIED BUDGET, SELECTED FISCAL YEARS, 1947–78

Tax category	Percent of total receipts, 1947	Compound growth rate, 1947–51	Percent of total receipts, 1951	Compound growth rate, 1951–55	Percent of total receipts, 1955	Compound growth rate, 1955–65	Percent of total receipts, 1965	Compound growth rate, 1965–69	Percent of total receipts, 1969	Compound growth rate, 1969–74	Percent of total receipts, 1974	Compound growth rate, 1974–78	Percent of total receipts, 1978	Compound growth rate, 1947–78
Personal income tax	46.7	4.77	41.8	7.40	43.9	5.43	41.8	15.64	46.5	6.40	44.9	10.38	45.0	7.68
Corporate income tax	22.4	13.11	27.3	6.09	27.3	3.61	21.8	9.56	19.5	1.04	14.6	19.90	14.9	6.41
Social insurance taxes and contributions	8.7	14.43	11.1	8.32	12.0	10.96	19.1	15.72	21.3	13.98	29.0	11.81	30.7	12.25
Excise taxes	18.7	4.75	16.7	1.37	13.9	4.78	12.5	1.10	8.1	2.05	6.4	2.07	4.6	3.05
Estate and gift taxes	2.0	−2.11	1.4	6.88	1.4	11.38	2.3	6.48	1.9	7.60	1.9	1.15	1.3	6.35
Customs duties	1.2	6.30	1.2	−1.00	.9	9.44	1.2	12.61	1.2	7.53	1.3	17.32	1.6	8.76
Deposit of earnings by Federal Reserve System		88.41	.4	7.35	.4	18.51	1.2	18.02	1.4	12.72	1.8	7.70	1.7	21.53
Other miscellaneous receipts	.2	.35	.1	7.36	.2	7.88	.2	2.70	.1	16.23	.2	9.55	.2	7.89
Total receipts		7.69		6.11		5.96		12.60		7.13		10.31		7.80

The national defense fraction naturally rose considerably during the Korean and Vietnam periods, causing the growth rate of total outlays to be quite high in these periods; however, the defense share has declined rapidly since fiscal year 1969 and was down to 23.3 percent of unified outlays by fiscal year 1978. A change is also occuring in the military spending mix which can be seen, though only dimly, in these data. Outlay category 050 in the unified budget includes military retirement programs as well as purchases of currently-produced goods and services. Retirement was a $9.2 billion item in the fiscal year 1978 budget (7.8 percent of the Function 050 total); while, e.g., in fiscal year 1962 it was $.89 billion or 1.8 percent of the Function 050 total. Thus although Function 050 has lost relative position in the budget over the years, that part of Function 050 which represents current goods purchases, salaries, etc. has lost relatively more. The NIA budget category "defense purchases of goods and services" does not include military retirement, which instead is treated "domestic transfer payments to persons". In the NIA budget, defense purchases of current output have gone from 30.3 percent of total budget expenditures in 1947 to 21.6 percent of the total in 1978—a substantially larger proportional decrease than that which shows up in the unified budget.

Other important programs in fiscal year 1948 were veterans benefits and services (Function 700), with 21.7 percent of the total; interest (900), with 17.1 percent; and international affairs (150), with 15.3 percent. International affairs has shown the lowest growth rate of all Functions (0.86 percent per year overall, and negative growth in several subperiods), and has fallen to 1.3 percent of unified outlays in fiscal year 1978. Of course, its rather large share in fiscal year 1948 was due to the operation of the Marshall Plan. The share of interest has been very stable at around 10 percent ever since the mid-1950's.[5] The veterans programs category has grown quite slowly (though with an increase in the late 1960's due to Vietnam) and has dropped to 4.2 percent of budget outlays.

Which are the fast-growing programs which have moved into dominant positions? This group of programs includes, most noticeably: Community and regional development (450), 2.4 percent of the total in fiscal year 1978 and growing rapidly at that time (though budgeted to decline in absolute terms in the coming years); education, training, employment, and social services (500), 5.9 percent of the total in fiscal year 1978 and increasing; health (550), 9.7 percent and increasing, though not at the extremely high compound growth rates it has shown over the past 10 years given current programs; and, above all, income security (600), now one-third of the unified budget, and budgeted to continue rising at a 10.7 percent growth rate in the next 2 fiscal years. While we cannot go over these expenditure categories on a detailed program-by-program basis, these functions taken together represented just half of fiscal year 1978 unified budget outlays, so it might be well at least to identify the largest component

[5] A substantial part of the interest payments shown in Function 900 are intragovernmental and go to the Federal trust funds ($8.53 billion in fiscal year 1978) and to the Federal Reserve System, which then returns most of it ($6.64 billion was returned by the Federal Reserve in fiscal year 1978). If this $15.2 billion were netted out, the interest share in the unified budget would be reduced to 6.5 percent in fiscal year 1978. In fiscal year 1948, the share would have been 14.3 percent, and in fiscal year 1965 it would have been 4.9 percent, on this basis.

programs. Of the $11.0 billion budgeted in fiscal year 1978 for community and regional development (Function 450), $5.5 billion, or half, is accounted for by the community development block grant program and by local public works projects, the former spending $2.5 billion aimed mainly at distressed urban areas and the latter applying $3 billion mainly for countercyclical purposes. In the education, training, employment, and social services Function (500) with a fiscal year 1978 budget of $26.5 billion, the largest outlays are for general training and employment programs established under the Comprehensive Employment and Training Act (CETA), $2.4 billion in fiscal year 1978; public service employment (PSE) programs operated via grants to State and local governments, $5.8 billion; and aid to elementary, secondary, and higher education totalling $6.2 billion. Under the health Function (550), whose budget was $43.7 billion in fiscal year 1978, the medicare and medicaid programs accounted for $35.9 billion. And the income security Function (600), with a fiscal year 1978 budget of $146.2 billion, essentially consists of social security (OASDI) payments ($92.2 billion), Federal retirement and disability ($10.5 billion), and a package of welfare programs collectively called "public assistance and other welfare supplements" ($26.5 billion).[6]

Even without the widely discussed growth of the Social Security System's outlays, this set of programs has grown enormously in the last 10 years or thereabouts. As recently as fiscal year 1965, Functions 450, 500, and 550 taken together constituted only 4.2 percent of total outlays; but in fiscal year 1978 they constituted 18.0 percent—and of course total outlays themselves had grown considerably during that period. To put it in dollar terms: In fiscal year 1965 these three Functions (450, 500, and 550) accounted for $4.98 billion of spending, while in fiscal year 1978 the amount was $81.2 billion. During these 13¼ calendar years, the three Functions together have grown at a compound annual rate of 23.45 percent. In comparison, the growth rate of the income security category appears relatively low over the same period—it was just 14.01 percent compounded.

The record for tax receipts under the two budgets over this period is contained in tables 3c and 3d. Let us look at the two budgets in tandem. The personal income tax has grown almost parallel with total tax revenues: it was 46.7 percent of total taxes in fiscal year 1947 and 45.0 percent of the total in fiscal year 1978 in the unified budget. From fiscal year 1951 to fiscal year 1965 its share declined by 2 or 3 percentage points (there were major tax cuts in 1948 and 1964, and underemployment in the late 1950's and early 1960's); but increasing economic activity, inflation, and the tax surcharge of 1698 probably all contributed to the increase in the personal income tax share back to 46.5 percent in fiscal year 1969 and about 45 percent since. (Inflation combined with tax rates—defined with respect to nominal income—has worked to increase the personal income tax share in recent years, but this effect seems to have been offset to a large degree by the tax cut of 1975; consequently the personal income tax share was 44.9 percent in fiscal year 1974 and 45.0 percent in fiscal year 1978.) The NIA budget data show very much the same

[6] These include mainly the following: Supplemental security income ($5.9 billion); Aid for Families With Dependent Children ($6.6 billion); food stamps ($5.5 billion); the school lunch program ($3.4 billion); and housing assistance ($3.7 billion).

pattern, with personal income taxes growing at almost exactly the same rate as total taxes over the whole period; the share declines somewhat in the 1950's and early 1960's, rises in the latter part of the 1960's, and returns to the longer run figure by 1974.

The corporate profits tax share of total tax revenues rose in the early 1950's in both budgets. Since then the fraction has been falling as corporate tax revenues have grown noticeably more slowly than total taxes. This relative loss of position reflects the effect of tax cuts, the somewhat slower growth rate of business profits than personal income, lack of progressivity in the structure of corporate profit tax rates, and the rather rapid rate of increase of another tax category: social insurance taxes and contributions.

These social insurance tax revenues have grown very rapidly throughout the whole period (a 12.25 percent growth) rate in the unified budget, and 11.23 percent in the NIA budget)—much more rapidly than total tax receipts. Their rate of increase was itself rising until the end of the 1960's (except for the 1951–55 subperiod), but has been gradually coming down again in the early 1970's. Under both budgets, personal income tax revenues plus social insurance taxes and contributions provided about 76 percent of total receipts in 1978 as against about 57 percent in 1947.

Of the remaining unified budget categories, the return to the Treasury by the Federal Reserve System of earnings in excess of its operating expenses has shown a very rapid growth rate, partly because the base for this calculation (earnings returned in fiscal year 1947) was extremely small, and partly because both Federal Reserve holdings of U.S. government securities and the interest rates paid on those securities have been rising very rapidly. Still, these revenues amounted only to 1.7 percent of the total in fiscal year 1978. Customs duties have increased slightly faster than total taxes, excise taxes and estate and gift taxes a bit slower, and other miscellaneous receipts at about the same rate. Thus in the NIA accounts, the category "indirect business taxes" grew at a 4.20 percent compound rate, as compared to 7.70 percent for all taxes: therefore this category falls from 18.0 percent to 6.5 percent of total receipts over the whole 31-year period.

The changes in the growth rate of total revenues from subperiod to subperiod is of course dominated by changes in the growth rates of the most important components: Personal and corporate income taxes in the earlier years, and personal income taxes and social insurance taxes and contributions in more recent times.

3. Systematic Influences on Budget Composition and Growth, 1947–78

In the previous section of this paper, it was shown that the period 1947–78 could be divided up into distinct subperiods where the two budgets are concerned; with considerable differences in growth rates of spending and tax receipts from one such subperiod to another. However, the descriptive approach used there is limited: it does not provide us with a general explanation of why spending and revenues behaved as they did. For that purpose we need an analytic structure which will systematically disentangle trend movements in budget components from cyclical and other responses. I have used the same simple model as the basis for all of the statistical work in this study, with only minor

variations in its specification for use in analyzing tax revenues as compared to its use in studying expenditures. These variations in specification were influenced by the descriptive analysis just discussed. We now turn to the structure of this model.

a. Specification of the Model

The model used here is very similar to one which has been employed by several scholars investigating changes in the pattern of income distribution.[7] The model as applied to shares of total NIA budget spending may be written as follows:

$$\left(\frac{E_i}{E}\right)_t = \alpha_i + \beta_{i1}\left(\frac{\text{actual } GNP}{\text{potential } GNP}\right)_t + \beta_{i2}\, Time_t + \beta_{i3}\, Time \cdot DUM51_t$$

$$+ \beta_{i4}\dot{\Delta} CPI_{t-1/2} + \beta_{i5}\, DUM72_t + \epsilon_{it}$$

Here the left-hand variable (E_i/E) is the fraction of the ith expenditure program relative to total budget spending in year t ($i=1, \ldots, n$, where n is the total number of spending programs). On the righthand side, the first variable, the ratio of actual to potential *GNP*, is meant to represent the business cycle. *Time* is a trend variable whose value increases by one unit each year. *DUM*51 is a "dummy variable" whose value is zero from 1947–50 and unity from 1951–78. In the spending regressions, this variable always multiplies the *Time* variable; the effect is to allow the coefficient of *Time*—i.e. the trend rate of change of the dependent variable—to change as of 1951 and beyond. *DUM*72 (or *DUM*73 in the unified budget regressions; the change of notation being due to the fact that the unified regressions use fiscal year instead of calendar year data) is a dummy variable whose value is zero from 1947–71 (FY 1948–FY 1972) and unity from 1972–78 (FY 1973–FY 1978). (The motivation for including these dummy variables is discussed below.) The variable $\dot{\Delta} CPI$ is the rate of inflation as measured by the annual percentage change in the Consumer Price Index (hereafter *CPI*).

While the specification shown above happens to be specific to NIA budget expenditure programs, its basic features are common to all of the spending and tax regressions for both budgets. The specific points of difference are as follows:

(*1*) *Dependent variable.*—Obviously the dependent variables will change as we move from program to program. There are two sets of regressions for each of the following budget groupings: NIA budget expenditures, NIA budget tax receipts, unified budget outlays, and unified budget tax receipts. One regression set involves shares of particular budget categories in the budget total, as in the above equation. The other is for ratios of particular budget categories to potential GNP. Thus for each spending and tax program, I seek to explain movements in its share of the budget, and its movements relative to movements in the economy. As a consequence, in addition

[7] See, e.g., Alan S. Blinder and Howard Y. Esaki, "Macroeconomic Activity and Income Distribution in the Postwar United States", Review of Economics and Statistics, LX (November 1978), pp. 604–609, and the citations given there. Whereas Blinder and Esaki and others have used this model to account for trend so that cyclical effects can be studied, we do just the opposite and account for cyclical and other forces so as to isolate the trend.

to the budget share regressions for NIA expenditures, for example, there will be another set of regressions involving the ratio of each expenditure component, and of total NIA expenditures, to potential GNP. For this latter set of regressions, the dependent variables will be (E_j/Pot. GNP), where $j=0, 1, \ldots, n$, and E_0 is total NIA spending.

I have varied the notation for the dependent variable in order to make it absolutely clear in every case which regressions are being presented in the Appendix tables where the complete set of results is given. Thus, for example, the dependent variables in the NIA tax share regressions are designated as (T_k/T), where there are $k=1, \ldots, m$ tax programs. A complete set of definitions for all of the dependent variables is contained in the Appendix.

(*2*) *Dummy variable specification.*—In general, dummy variables like DUM51 and DUM72 are used to accommodate identifiable, abrupt changes in the pattern of spending or taxing. Thus, our descriptive analysis identified several points in time on or about which accelerations or decelerations in the budget apparently occurred. It is clear, for instance, that there was a sharp spending acceleration connected with the Korean episode, as of about 1951. Trial regressions showed that DUM51 multiplying the Time variable was significant in many expenditure regressions; hence we have always included it. The variable DUM72 (or equivalently in the unified budget regressions, DUM 73) is included to accommodate another special spending phenomenon which can be identified *a priori*. In 1972, the Congress enacted the general revenue sharing program under which (originally) $30.2 billion was to be distributed to State and local governments over a five-year period, with the first outlay occurring in December 1972. Since the program went from zero to $6.6 billion in one year, it was felt appropriate to allow for an abrupt and one-time shift in the budget at this point; hence this dummy, which permits the regression intercept term to change permanently at this point in time so that, in effect, the dependent variables can change for given values of the other explanatory variables.

Tax receipts are affected by a somewhat different set of ad hoc events than expenditures. In particular, one might expect the major changes in the tax laws which have been enacted at several points in the postwar period to show up as abrupt shifts in these regressions. There were four major tax revisions in the period covered by this study: The tax reductions of 1948, 1964, and 1975; and the tax surcharge of 1968. While dummies for all of these changes were used in trial regressions, only DUM64 consistently was significant. It works best when allowed to multiply the time trend variable; this is consistent with the fact that the 1964 tax reduction was mainly directed at changing tax rates rather than such features of the tax law as exemptions. Therefore the tax regressions contain the multiplicative variable Time·DUM64.

The logic of this general approach is as follows: The ratio of actual to potential GNP is used to measure all of the cyclical influences which systematically affect the budget, e.g. through unemployment compensation and other cyclically sensitive programs. The presence of the inflation rate in these regressions is due to the fact that some of the biggest spending components—e.g. Social Security and other retirement programs—are indexed for inflation so that payments automatically respond to movements in the CPI. While spending for other

programs is not based formally on an indexing formula, there appears to be a considerable degree of informal indexing—that is, outlays for many programs are increased as prices go up in order to preserve the real level of spending for those programs.[8] Because spending responds with a lag of some months to CPI changes under several of the formulas used in formally indexed programs, the CPI value is lagged by one-half year in these regressions. Tax programs, typically being defined with regard to current dollar income, are likely to show an indexing effect, and so the inflation variable also appears in the tax equations. Since wages, profits, etc. probably do not respond instantly to changes in inflation, the half-year lag employed in the spending equations was also used in the tax equations. Finally, the time trend variable is meant to quantify the systematic forces—social, political, economic—which cause programs to wax or wane in the longer run.

This model was fitted by the technique of ordinary least squares (hereafter OLS) to annual data covering spending and taxes in the two budgets over the period 1947–78 (NIA data) or fiscal year 1948–fiscal year 1978 (unified data). For some of the unified budget regressions where spending subfunctions are concerned, data were available only beginning with fiscal year 1962. The Transition Quarter, 1976 III, was omitted from the regressions because including it presented statistical problems. (Of course, other variables such as the time trend were adjusted appropriately to reflect the fact that the Transition Quarter had occurred.) Comparisons of (a) trial regressions including it with (b) the final results excluding it indicated that its inclusion or exclusion had little effect on the estimates.

A very useful aspect of the OLS technique for a set of regressions in which the dependent variables consist of shares or ratios adding to unity and in which each equation contains the same explanatory variables is that the procedure imposes the following "adding-up conditions" across the whole set of equations (the notation here supposes that there are n equations, each with the same set of m explanatory variables):[9]

$$\sum_{i=1}^{n} \alpha_i = 1$$

$$\sum_{i=1}^{n} \beta_{ij} = 0 (j = 1, \ldots, m)$$

$$\sum_{i=1}^{n} \epsilon_{it} = 0 \text{ for all } t$$

In other words, the set of coefficients estimated for any given variable will add up to zero across the whole set of equations. This means that, e.g., if the estimates of the defense spending equation show that the share in total Federal spending of defense purchases goes down one percentage point when the business cycle indicator variable (in this case, the ratio of actual to potential GNP) goes down by one unit, then the estimates for the other spending equations of the coefficient

[8] For a thorough review of indexing in the Federal budget on a program-by-program basis, see Peter K. Clark, "The Effect of Inflation on Federal Expenditures", Background Paper Number 9, Congressional Budget Office, Washington, D.C., 1976.

[9] This discussion follows that in Blinder and Esaki, *op. cit.*, p. 604.

for that particular variable will show that the combined shares of all the other spending categories rise by one percentage point. (Obviously, the particular shares of the other subcategories may themselves rise or fall by more or less than one percentage point.) We may say that in this respect the estimates display internal consistency. Further, the intercepts or constant terms in these regressions sum to one (so that the shares would sum to one if all of the explanatory variables had values of zero); and finally the errors (the difference as of a particular date between the observed value of the left-hand variable and the value implied by the coefficient estimates and values of the explanatory variables) sum to zero for each and every point of time.

Slightly different, but now rather obvious, properties apply when we shift from (a) regressions involving shares that add up to unity to (b) regressions involving ratios to some particular variable such as potential GNP. In the latter case, we do regressions first of the ratios of total spending or tax revenues to potential GNP, and then regressions involving the ratios of particular spending or tax programs to potential GNP; in each case, the particular programs add up to the total amount of spending or revenues. Now the individual equation intercept values for the particular programs add up to the value of the ratios of total spending (or taxing) to potential GNP. The coefficients estimated for each explanatory variable in each subprogram equation add up to the coefficient estimated in the regression of the ratio of total spending (or taxing) to potential GNP. The subprogram equation errors add to the error in the aggregated equation at every point in time.

As will be seen below in the detailed discussion of results in the next section, this model is able to explain 80 percent or more of the movement of the dependent variable in most of these regressions, and over 95 percent in several cases. There is no evidence of serious autocorrelation in the residuals of most of the equations, suggesting that no important explanatory variable has been overlooked. If autocorrelation appears, as it does in just a few equations, those equations are reestimated with an autocorrelation correction procedure which will be described below. The use of ordinary least squares presupposes that there is no important causal impulse running from the dependent variable to any of the explanatory variables. If there were such "reverse causality", biased coefficient estimates would result. It seems reasonable to assume its absence at least for the regressions using budget shares as the dependent variables. This may be a more dubious assumption for the regressions in which the ratio of the budget or its components to GNP is being explained. It is in order to minimize the seriousness of this problem that potential GNP rather than actual GNP was used in the denominator of the dependent variables in these regressions.

Having obtained our basic estimates of the nature of these trend, cyclical, inflation-induced, and other effects over the whole period, we then wish to investigate whether these estimates really are characteristic of the whole period; that is, we want to investigate whether or not there occurred a significant change in the structure of the budget, and in its relationship to the economy, at some point or points in time during the period. As noted earlier, we have already explicitly accounted for some shifts we know to have taken place, via the use of

dummy variables; as for example specific tax program changes, or spending acceleration during the Korean period.[10] But our descriptive analysis of the budget data indicated other instances in which budget growth accelerated or decelerated. We will be particularly interested in the period of the middle and late 1960's, because the budget began to show continuous deficits at that time (suggesting that some sort of structural change might have occurred), and because our visual analysis indicated that shifts in budget growth might have occurred around 1965 and again around 1969.

We could investigate this issue by more extensive use of the dummy variable technique, and in fact some experimenting in this direction was done. But the particular regression specification outlined above seemed to be the most satisfactory one overall, and therefore tests for structural change in the middle and late 1960's were done by (1) subjecting our basic results, budget category by budget category, to a simple statistical test in which we split the data at the point where a structural change is thought to have occurred; (2) doing regressions for each resulting subperiod; (3) comparing these results with a regression over the whole period; and (4) inferring with a certain degree of confidence whether the results from the two subperiods can be said to have been based on data from the same "world". This procedure is a version of the well-known Chow test.[11] We shall use it to test systematically for possible structural change as of 1965 and 1969.

b. The Statistical Results

The results of the econometric work using the model presented above are given in detail in tables I.A.1–II.B.2 in the appendix to this paper. Following the tables themselves is a detailed description of the organization of these tables, definitions of the symbols used to represent the different budget categories and subcategories, and the statistical criteria employed. Here we will attempt to highlight and summarize these results in a systematic way, looking first at the results of the spending regressions involving budget shares, then at spending relative to potential GNP, and finally at tax shares and tax receipts relative to potential GNP. A standard format will be followed in these summaries. For every set of regressions, I first tabulate the trend coefficients which were statistically significant, listing those which are positive (indicating a rising budget share or position relative to potential GNP) followed by those which are negative (meaning a declining budget share or position relative to the economy). Having dealt with the significant trends, I then discuss the extent to which the set of regressions in question shows significant responses to cyclical and price-indexing influences. In each case I have listed the numbers of the relevant equations in the appendix tables in order to facilitate reference to these tables if desired. In the summaries of significant trend effects I have also shown the mean values of the respective dependent variables, as a convenient measure of the variable's relative importance. The reader may also refer to tables 3a–3d in section 2 of this paper, where program shares at different points of time are given.

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[10] It is interesting that the degree of spending acceleration during the Vietnam period is much less noticeable than that in the Korean era, as can readily be seen in Figures 1a and 1b.

[11] G. C. Chow, "Tests of Equality Between Sets of Coefficients in Two Linear Regressions", "Econometrica", 28 (1960), pp. 591–605.

(1) Spending results: budget shares

The econometric results summarizing the factors affecting the budget shares of spending programs are given in the appendix in table I.A.1 for the NIA budget and in tables I.A.2a—c for the unified budget. We shall begin by examining the results based on the relatively more aggregated expenditure categories in the NIA budget, with primary emphasis on the evidence as regards the presence of time trends.

As shown in table I.A.1, the budget share of "other expenditures", equation (7), showed evidence of structural change following 1965, so this equation is reestimated with separate results given for 1947–65 and 1966–78.[12] Thus the relevant equations for our discussion are equations (1)–(6), (7.1), and (7.2). Of this set, equations (1)–(5), (7.1), and (7.2) show significant time trend coefficients as summarized below. (In this and following tabulations, we shall only list significant trend coefficients from the more recent subperiod of equations with structural breaks. Also, the coefficients of the shift variables Time·DUM51 and Time·DUM64 will be added to the basic trend coefficient whenever these shift coefficients are significant. Hence only the coefficient of Time·DUM51 from equation (7.2) shows up in Table 4 below.)

TABLE 4.—SIGNIFICANT TIME TREND COEFFICIENTS: NIA BUDGET EXPENDITURES, BUDGET SHARES

	Equation No. and category	Percent of total expenditure at the mean, 1947–78	Time trend of share: percentage points per year
(2)	Nondefense purchases	11.34	0.197
(3)	Domestic transfer payments	25.91	.740
(5)	Grants-in-aid to State and local governments	9.04	.434
	Subtotal: positive trends	46.29	1.371
(1)	Defense purchases	41.12	−1.315
(4)	Foreign transfer payments	2.79	−.117
(6)	Net interest	7.27	−.002
(7.2)	Other expenditures	2.54	[1] −.001
	Subtotal: negative trends	53.72	−1.435

[1] Since 1966 only.

Source: Appendix, table I.A.1.

These data show that about 46 percent of NIA budget expenditures display a significant upward trend in terms of budget share, with the most rapid trend growth in share by far shown by domestic transfer payments. About 54 percent of total NIA expenditures show a significant downward trend in budget share; this category consists mostly of defense purchases. It is interesting to note that the first three categories with trend coefficients totalling 1.371, almost exactly offset the trend in defense purchases. In other words, the loss in budget position experienced by defense purchases is taken up by nondefense purchases, grants-in-aid, and (predominantly) by increases in domestic transfer payments.

[12] Because of the small size and disparate nature of the "Other expenditure" category, I did not reestimate equation (7), Table I.A.1 separately with a correction for serial correlation.

Looking at the effects of cyclical and price-indexing phenomena, we note in table I.A.1 that only defense purchases (equation (1)) and domestic transfer payments (equation (3)) display significant responses to cyclical movements of the economy. The cyclical response of defense purchases is positive, and indicates that budget dollars tend to flow to defense from other budget uses when times are good, and away from defense when times are hard. The cyclical response of domestic transfers is negative, due to the fact that unemployment compensation and other cyclically sensitive transfer and welfare programs fall into this category. Both responses are fairly substantial, with coefficient values of .375 for defense purchases and −.468 for domestic transfers. These are interpreted in the following way: If actual GNP rises one percentage point with respect to potential GNP (e.g., if the ratio

$$\frac{\text{Actual GNP}}{\text{Potential GNP}}$$

rises from .97 to .98), then the share of defense purchases will rise by .375 percentage points (e.g., from 41.12 percent to 41.495 percent) and the share of domestic transfer payments will fall by .468 percentage points (e.g., from 25.91 percent to 25.442 percent), according to these estimates. Here an interesting finding is that the cyclical loss in share of domestic transfers is almost entirely accounted for by the defense purchase gain plus the gain in the share of grants-in-aid (whose coefficient of .051, with t-ratio of 1.35, is the most significant among the remaining expediture categories).

Lastly we consider the price-indexing results. If nominal expenditures on a program are adjusted so as just to keep up with the inflation rate, other things equal, its share ought neither to increase nor to decrease as the inflation rate changes; that is, the price-indexing coefficient in our regressions ought to be insignificant. In these budget share regressions, therefore, a significant and positive coefficient on the variable ΔCPI would indicate overindexing (i.e., a budget share which is rising due to the effects of inflation alone), while a significant negative coefficient would indicate underindexing. Among the NIA expenditure categories, defense purchases (equation (1)) seem to be underindexed in this sense, with the estimate indicating a loss in percentage of the total budget of .29 percentage points for each one-point rise in the CPI inflation rate. Grants-in-aid (equation(5)) appear to be overindexed, gaining .08 percentage points for each one-point increase in inflation.

Net interest payments (equation (6)) also respond significantly to changes in the inflation rate. This phenomenon differs from the indexing effects in other categories in that it reflects changes in the expectations of lenders and borrowers (buyers and sellers in the securities markets). If both lenders and borrowers expect that the inflation rate will change by a given amount, market interest rates will tend to change by approximately this amount, as the economist Irving Fisher pointed out many years ago. Changes in inflationary expectations probably are influenced substantially by current inflationary experience; hence the connection between our inflation variable and interest payments. If actual experience were reflected immediately and fully

in expectations, and if expectations showed up immediately and fully in interest payments, a large coefficient on the inflation variable in equation (6) would be expected; for instance, a rise in the inflation rate from 5 to 6 percent should increase interest payments by 20 percent under these conditions. At the means, however, a one-point inflation rate increase generates approximately a 2–percent rise in net interest payments. This is very likely due to the fact that experience is not reflected immediately in expectations, and that in any given year only part of the Federal debt is newly issued (for example, at present about 47 percent of the debt held outside of the Federal government and Federal Reserve System has one year or less to maturity).

In table I.A.2.a, the results of regressions for the shares of the major functional expenditure categories in the unified budget are reported. Among equations (1)–(18), there are several which display a very low Durbin-Watson statistic, indicating significant serial correlation in the regression residuals, a phenomenon which may lead to underestimates of the standard errors of the regression coefficients and hence to overly high t-ratios and the possibility of judging a coefficient to be significantly different from zero when in fact it is not. There is a simple way to deal with this problem: namely, to assume a systematic relationship between this period's and last period's errors, but with a random element also included. Such an error scheme can be incorporated directly into the regressions and will meet the problem described above; however, this adjustment results in loss of the precise adding-up property mentioned earlier (because that property requires that each of a set of regressions use the same set of explanatory variables; while in regression, using the error transformation just mentioned, each equation typically has the lagged value of its own dependent variable occurring as an explanatory variable).

Nevertheless, I have proceeded in this way, in the hope that the coefficient estimates in the reestimated equations would not change a great deal (i.e., in the hope that the adding-up property would hold at least approximately). This seems to be the case in most of the instances which I have checked. For instance, in Table I.A.2.a., the relevant equations are (1), (2), (3′)−(5′), (6), (7), (8′)−(11′), (12), (13), (14′), (15), (16.1), (16.2), (17), and (18′), where the primes indicate equations which have been reestimated with a correction for serially correlated residuals (note that a structural shift occurs in equation (16)). If we add up the coefficients for the time trend variable across all of these equations (some of which are from the original set of regressions, and others of which have been reestimated), we find that the sum is −.0022, which is indeed fairly close to zero. Also, it can be verified by comparison that the estimates of particular parameters do not change very much in most cases when the equation is reestimated.

Following is a summary of the regression findings as regard time trends for the budget shares of unified budget outlay functional categories:

TABLE 5.—SIGNIFICANT TIME TREND COEFFICIENTS: UNIFIED BUDGET OUTLAYS, FUNCTIONAL BREAKDOWN, BUDGET SHARES

Equation No. and function		Percent of total outlays at the mean, fiscal year 1948–78	Time trend of share: Percentage points per year
(9′)	450—Community and regional development	0.70	0.065
(10′)	500—Education, training, employment, and social services	2.46	.231
(11′)	550—Health	3.42	.340
(12)	600—Income security	20.18	.688
	Subtotal: positive trends	26.76	1.324
(1)	050—National defense	42.24	−1.213
(2)	150—International affairs	4.24	−.105
(13)	700—Veterans benefits and services	6.94	−.224
(15)	800—General government	1.23	−.030
(16.2)	850—General purpose fiscal assistance	.60	[1] −.121
(17)	900—Interest	9.43	−.003
	Subtotal: negative trends	64.68	−1.696

[1] Since 1970 only.

Source: Appendix, table I.A.2.a.

These results illustrate in more detail than the NIA regressions the substantial shifts that have been occurring within the budget on the outlays side, with national defense plus a few programs which by now are small losing position steadily, while income security plus the cluster of transfer programs mentioned earlier—Functions 450, 500, and 550—have been gaining trendwise. The relative magnitudes are much like those in the NIA budget results. The national defense share has been falling trendwise almost twice as fast as the income security share has been rising. But the other three programs just mentioned taken together have been rising on trend about as rapidly as income security. The effects of such rapid trend growth can be illustrated in an interesting way. The average budget share of these four growing functions over the whole period FY 1948–FY 1979 was 26.76 percent, as shown in the above tabulation.

But as of fiscal year 1978, the combined share of these same functions was 50.4 percent. Likewise, while the average share of Function 050 (National defense) was 42.2 percent over the whole period, as is given in table 5, its share as of fiscal year 1978 was 23.3 percent.

Only one functional category showed evidence of a structural change—Function 850 (General purpose fiscal assistance). This function is dominated by the general revenue sharing program. A break was found after fiscal year 1969, with a change from a very small positive trend effect in 1948–69 to a somewhat larger negative trend effect in the 1970–78 subperiod. This result ought to be interpreted in the light of the performance of DUM73, a variable with a

large, positive, and significant coefficient. This variable allowed the share of Function 850 to rise sharply at the turn of the decade; with that rather high level as a starting point, the share has lost position slightly since 1970.

Looking at the other dimensions of this set of estimates in table I.A.2.a. we note the following significant cyclical responses:

Equation No. and function	Regression coefficient
(5′) 300—Natural resources and environment	−0.048
(12) 600—Income security	−.694

(Note that while equation (16) indicates that the budget share of Function 850 responds to cyclical forces, this estimate also indicates the presence of a structural shift; and the two subperiod estimates (16.1) and (16.2) do not show significant cyclical responses.)

Most of the cyclical response of the functional shares occurs via Function 600 (Income security), which is not surprising since this category includes various cyclically sensitive transfer programs. The coefficients are interpreted as before: that is, they indicate that, e.g., a one-percentage-point increase in the ratio of actual GNP to potential GNP will reduce the budget share of Function 600 by .694 percentage points.

As to price indexing, only a few functions show significant but rather small effects. Functions 300 (Natural resources and environment, equation (5′)) and 350 (Agriculture, equation (6)) show evidence of being slightly underindexed with coefficients of −.0004 and −.0001 respectively (meaning that a one-point rise in inflation would be accompanied by share reductions of .04 and .01 percentage points), while Functions 800 (General government, equation (15)) and 900 (Interest, equation (17)) show positive indexing, with coefficients of .0004 and .0012 respectively. It will be recalled that the NIA regressions also showed an indexing effect for interest payments, and it can be seen that the dimension of the effect is similar in the two budgets. In the NIA regressions, the net interest share was 7.3 percent of expenditures at the mean, and according to the regression findings the share rose .13 percentage points with each one-point rise in the CPI inflation rate. According to equation (17) in table I.A.2.a, interest payments are 9.4 percent of unified outlays at the mean, and the share changes .12 percentage points for each one-point inflation change.

Table I.A.2.b in the appendix shows the results of regressions using as dependent variables the shares of particular unified budget subfunctions. These variables are defined on pp. A 26–A27 in the appendix. They are supposed to reflect the movements of particular programs more closely than the functional totals, and in this set of regressions the idea was to separate out and study in isolation the behavior of some of the larger outlay components. Indeed, the 13 components chosen accounted for 79.0 percent of total unified outlays at the mean.[13] Unfortunately, in general, data are available on this

[13] Note that these 13 subcategories, accounting for 79 percent of total unified budget spending, involve only 7 of the 18 unified budget functional categories: 050, 400, 500, 550, 600, 900, and 950. And not all of the spending in these seven functions is included.

basis only beginning with fiscal year 1962 (however, as we shall see later, data on certain particular programs classified as "relatively uncontrollable" can be gotten beginning with fiscal year 1948).

In these regressions, again, serial correlation problems were encountered and alternative estimates of some equations were made. Furthermore, category 0.1 (Outlays for military personnel) shows evidence of a structural shift after 1969. The relevant set of equations therefore includes equations (1.1), (1.2), (2')–(5'), (6), (7), (8'), and (9)–(14). As before, a prime following the equation number denotes that the equation was reestimated with a correction for serial correlation. Equation numbers like (1.1), (1.2) indicate that there has been a structural break in the equation in question (in this case, equation (1)), and the two numbers indicate the subperiod regressions for this equation.

At this level of detail, there is much more evidence of trend effects at work than in the more aggregated data (of course, it must be remembered that these regressions only span data beginning with fiscal year 1962, while the preceding set of regressions covered data beginning with fiscal year 1948). For convenience, a tabulation of significant trend coefficients follows:

TABLE 6.—SIGNIFICANT TIME TREND COEFFICIENTS: UNIFIED BUDGET OUTLAYS, PARTICULAR SUBFUNCTIONS, BUDGET SHARES

	Equation No. and category	Percent of total outlays at the mean, fiscal year 1962–78	Time Trend of share: Percentage points per year
(2')	0.2—Retired military personnel: Subfunction 051 (part)	1.48	0.074
(6)	0.6—Elementary, secondary, higher, and vocational education: Subfunctions 501 and 502	1.84	.124
(7)	0.7—Training, employment, and other labor services: Subfunctions 504 and 505	1.06	.149
(8')	0.8—Health care services: Subfunction 551	4.78	.564
(9)	0.9—Social security: Subfunction 601	16.49	.354
(10)	0.10—Federal employee retirement and disability: Subfunction 602	1.59	.066
(12)	0.12—Public assistance and other income supplements: Subfunction 604	3.88	.187
	Subtotal: positive trends	31.12	1.518
(1.2)	0.1—Military personnel: Subfunction 051 (part)	9.83	[1] —.495
(3')	0.3—National defense other than active and retired military personnel: Subfunction 051 (part)	23.86	—.953
(14)	Other—All functions and subfunctions not treated in other regressions)	21.03	—.361
	Subtotal: negative trends	54.72	—1.809

[1] Since 1970 only.

Source: Appendix, table I.A.2.b.

Thus according to these estimates, the budget shares of about 85 percent of unified budget outlays display trend influences, with the shares of retirement, other transfer, and welfare programs moving persistently upward, and the shares of outlays on defense spending and military personnel trending downward. The picture actually is very similar to that which was obtained from the regressions using the functional categories, and also to the NIA regressions.[14] Here we get increased detail. For example, in the previous set of regressions we found that the trend coefficient for Function 500 (interpreted as

[14] Because the period covered by the regressions in table 6 begins later, but ends at the same time as the period covered by the regressions in table 5, the percentage at the mean of outlays in table 6 showing upward trends is naturally larger, and the percent at the mean of outlays showing downward trends is naturally smaller than in table 5.

percentage points per year of share change) was .231. In the present regressions we treat separately the sum of Subfunctions 501 and 502, and also the sum of 504 and 505, and have estimated trend coefficients of .124 and .149 respectively for them. These sum to .273 (Subfunctions 503 and 505, and Function 500's "Deductions for Offsetting Receipts", are grouped together in the "Other" category).

How do these results relate to the set of functional regressions just discussed above? It seems valid to consider the two sets of estimates jointly; that is, to use the program-specific results from table 6 together with the function-specific results from table 5 for functions other than Functions 050, 500, 550, and 600 which have significant trend coefficients. This set includes Functions 150, 450, 700, 800, 850, and 900. These functions, after all, did not show evidence of structural break in the early 1960's, so it seems reasonable to assume that their trends continued at the same rate in the 1960's as earlier.

Thus we may infer that trends exist in the budget shares of the subfunctions shown in the above tabulation, as well as in Functions 150, 450, 700, 800, 850, and 900; and that such trend forces affect the budget shares of over 85 percent of total outlays.

Significantly cyclical responsiveness is shown by only a few categories, as summarized in the following tabulation:

	Equation No. and category	Regression coefficient
(1.2)	0.1—Military personnel: Subfunction 051 (part)	[1] 0.201
(6)	0.6—Elementary, secondary, higher, and vocational education: Subfunctions 501 and 502	.122
(11)	0.11—Unemployment compensation: Subfunction 603	−.312
(12)	0.12—Public assistance and other income supplements: Subfunction 604	−.192

[1] Since 1970 only.

These coefficients have the same interpretation as before: for example, when the ratio of actual to potential GNP rises from .97 to .98, the budget share of unemployment compensation outlays falls by about three-tenths of a percentage point.

Significant price-indexing effects are shown only by Category 0.6 (equation (6), Subfunctions 501 and 502), which appears to be overindexed to the degree that a one-percentage-point increase in the inflation rate would raise its share by .10 percentage points; and Category 0.7 (equation (7)), Subfunctions 504 and 505), which is underindexed to a slightly smaller degree (−.07 percentage points). We may note in this regard that the share of Function 500, which includes these subfunctions, does not show evidence of either over- or underindexing (see Table I.A.2.a, equation (10′)).

Finally, data on the outlays for certain subfunctions of the unified budget are available back to FY 1948, through the categorization of outlays into "relatively controllable" and "relatively uncontrollable" classes by the Office of Management and Budget in their report entitled "Federal Government Finances." While these data are organized in a slightly different way than the data used so far, and while only some series are available back to 1948, those that are so organized are included as a matter of interest. Note that the particular expenditures included in these regressions constitute only about two-thirds of all

outlays classified as "relatively uncontrollable"; but data on the remaining outlays in this category appear to be available only for a much shorter time period.)

The results of this set of regressions are reported in Table I.A.2.c in the appendix. The dependent variables are defined on p. A 27 in the appendix. It will be noted that a number of these equations show signs of structural change, and a few of them also required reestimation due to serial correlation problems. The relevant equations are: (1'), (2), (3), (4), (5'.1), (5'.2), (6'.1), (6'.2), (7.1), and (7.2). It is interesting to note that, except for category U.7 (Public assistance and related programs), the shares in unified outlays represented by all of these variables show significant trend effects. The coefficient estimates are summarized in convenient form below:

TABLE 7.—SIGNIFICANT TIME TREND COEFFICIENTS: UNIFIED BUDGET OUTLAYS, CONTROLLABLE-UNCONTROLLABLE CATEGORIZATION, BUDGET SHARES

Equation No. and category		Percent of total outlays at the mean, fiscal year 1948–78	Time trend of share: Percentage points per year
(1')	U.1—Social Security and railroad retirement payments	12.76	0.529
(2)	U.2—Federal employee retirement and insurance payments, including military	2.32	.098
(5'.2)	U.5—Medicare and medicaid	2.28	[1] .759
(6'.2)	U.6—Housing payments	.25	[2] .060
	Subtotal: positive trends	17.61	1.446
(3)	U.3—Unemployment assistance	3.04	—.036
(4)	U.4—Veterans benefits	5.44	—.174
	Subtotal: negative trends	8.48	—.212

[1] Since 1965 only.
[2] Since 1970 only.

Source: Appendix: table I.A.2.c.

These six categories plus category U.7 (which did not show any significant trend movement in its share) constitute 28.9 percent of unified budget outlays at the mean. As before, we see strong upward trends in Social Security and retirement payments, and in health benefits. The upward trend in housing payments is very similar in size to the trend effect exhibited by Function 450 (Community and regional development) in the regressions (based on functional categories), although these housing payments are not from that category (they are handled as part of Function 600). The significant downtrend in unemployment assistance is new: in the previous set of regressions on subfunctions, Category 0.11 (Subfunction 603 in the unified budget) displayed a negative but insignificant trend coefficient. However, U.3 seems to be a somewhat broader category, as it comprises 3.04 percent of unified outlays as compared to 2.69 percent for Subfunction 603.

It is a little surprising that public assistance payments, Category U.7, fails to show a trend effect (see equations (7.1) and (7.2), table I.A.2.c), since, in the previous set of regressions, Category 0.12 (Public assistance and other income supplements) did show such an effect. In this case Category 0.12 is more the inclusive one, accounting for almost 4 percent of unified outlays as compared with about 2.8

percent for U.7. However, the regression involving Category 0.12 covered the period only since fiscal year 1962, while the regression involving U.7 includes the whole postwar period and shows evidence of a structural change after 1969. (Equation (7), Table I.A.2.c, which does not allow for a structural break, also shows evidence of an upward time trend.) Hence we conclude that the apparent upward trend found earlier for public assistance programs probably was a reflection of the underlying structural change, and the heightened cyclical response of this variable in the latter subperiod.

Significant cyclical movements in budget share are shown only by unemployment assistance payments (U.3), with a coefficient of −.349 (equation (3)) and—since 1969—public assistance payments, (U.7), with a coefficient of −.320 (equation (7.2)). These results confirm those from the previous set of regressions, though here the cyclical response of public assistance payments is somewhat stronger than in the subfunction regressions. This may also be due to the fact that a structural break is indicated for Category U.7, with an insignificant cyclical coefficient found in the earlier subperiod. The subfunction regression (equation (12), table I.A.2.b) indicates no break, so the cyclical effect measured there is an average of experience over the whole period fiscal year 1962–fiscal year 1978. Lastly, there is no evidence of substantial over- or under-indexing of these programs for inflation. This result is not inconsistent with earlier findings, which indicated that most of the effects of inflation are felt in the interest payment share; and interest payments are not included in this set of regressions.

(2) SPENDING RESULTS: RATIOS TO POTENTIAL GNP

Having investigated movements in the composition of budget spending, we now turn our attention to movements in the budget and its components relative to the economy. The same basic model as before is used, except that now the dependent variable is the ratio of total spending or of particular spending components to potential GNP. As explained earlier, this formulation is preferred over one using actual GNP as the denominator of the dependent variable (and, e.g., the unemployment rate as the cyclical indicator) because it avoids statistical problems related to causality running from the dependent variable to one or more of the explanatory variables, and consequent biased estimates of the regression coefficients.

The regression results summarizing the factors affecting the relationship of total budget spending and its components to potential GNP are given in the appendix in table I.B.1 for the NIA budget and in table I.B.2.a–c for the unified budget. As before, in scrutinizing these results we shall be interested primarily in identifying trends: indeed, the basic purpose of the statistical procedure used is to separate trend forces from cyclical and other influences so as to assess the size of the pure trend effects. Having analyzed the evidence on trends, we shall follow our earlier procedure and note the nature of the other influences systematically and significantly affecting the relationship of budget spending to the economy.

It might be well to point out here that, in these regressions, a new "adding-up property" holds. For any given explanatory variable, the

sum of the regression estimates of its coefficients in the regressions involving particular spending categories will equal the regression estimate for that coefficient in the regression involving total spending. Also, the intercept estimates for each individual spending category will sum up to the intercept estimate for the regression involving total spending.

An obvious question at this point concerns the degree of consistency between the results for budget shares and the results based on ratios to potential GNP. There are at least two kinds of consistency which might be expected, the first being of a broad or general kind, and the second being arithmetic. The first can best be defined by example: If we found that total budget spending or revenues relative to potential GNP were not influenced by price movements, then it should be true that the particular subcategories whose budget share was affected significantly by price movements should be the ones whose position relative to potential GNP is influenced by price movements. While similar patterns are indeed found, this condition is not always met in our results: these results possibly reflect some statistical problems, such as multicollinearity, to a certain degree. It should also be remembered that our standard for statistical significance—a t-ratio of two or more in absolute value—is rather arbitrary so that a result might be judged significant in one case and insignificant in another, just because their particular t-ratios happen to fall close to but on either side of the standard.

There also exists an arithmetic relationship connecting these results, of the following kind. Suppose as an example we are studying movements in the ratio E_i/Y^*, where E_i is a particular spending category and Y^* stands for potential GNP. This ratio can of course be written as the product $(E_i/E)\ (E/Y^*)$, where E is total budget spending. This means that the change in the ratio E_i/Y^* due to a change, e.g., in the ratio of actual to potential GNP, Y/Y^*, which we might write as

$$\frac{d\left(\frac{E_i}{Y^*}\right)}{d\left(\frac{Y}{Y^*}\right)},$$

could be written as

$$\frac{d\left[\frac{E_i}{E}\cdot\frac{E}{Y^*}\right]}{d\left(\frac{Y}{Y^*}\right)}=\left(\frac{E_i}{E}\right)\frac{d\left(\frac{E}{Y^*}\right)}{d\left(\frac{Y}{Y^*}\right)}+\left(\frac{E}{Y^*}\right)\frac{d\left(\frac{E_i}{E}\right)}{d\left(\frac{Y}{Y^*}\right)}+\text{second order terms.}$$

Now the terms

$$\frac{d\left(\frac{E}{Y^*}\right)}{d\left(\frac{Y}{Y^*}\right)}$$

and

$$\frac{d\left(\frac{E_i}{E}\right)}{d\left(\frac{Y}{Y^*}\right)}$$

are regression coefficients, as is the term

$$\frac{d\left(\frac{E_i}{Y^*}\right)}{d\left(\frac{Y}{Y^*}\right)},$$

and this says that a given coefficient from the ratios-to-potential GNP regressions which we are about to examine ought to be derivable as a weighted average of corresponding coefficients from the shares regressions and from the regression involving total spending relative to potential GNP, with the weights being budget shares and the ratio of total spending to potential GNP.

While in principle such calculations could be made and the coefficients of the ratios-to-potential GNP relationships derived without further regressions, the procedure is cumbersome and I have chosen to do the regressions instead. I have checked one or two of the results to assure myself that the results were indeed at least roughly consistent, and this turned out to be so at least for those particular cases.

We first take up the NIA budget results (table I.B.1). Equation (1) shows the regression estimate for total NIA expenditures relative to potential GNP. On the average, NIA spending has been 18.75 percent of potential GNP over 1947–78. But this ratio has been trending upward significantly over period, according to this estimate; since 1951, the rate has been .092 percentage points per year. The ratio of total expenditures to potential GNP shows no significant response to cyclical or price-index influences.

It might be useful to look ahead to the comparable unified budget results (table I.B.2.a, equation (1)). Total unified spending has also been trending upward significantly at a rate of .137 percentage points per year since 1951 (at the mean, total spending is 18.78 percent of potential GNP—almost identical to NIA spending). Here, also, there is no evidence of other forces systematically affecting spending relative to income; and it is worth noting further that there is no evidence suggesting a structural shift in either of these regressions. The faster rise of unified spending as compared to NIA spending is most likely due to the inclusion of Federal credit programs in the unified figures, as we noted at the beginning of this paper.

Looking at individual NIA expenditure categories, we note that there is evidence of structural shifts after 1965 in the net interest and "other" equations ((7) and (8)). Therefore the relevant equations for this discussion are (1)–(6), (7.1), (7.2), (8.1), and (8.2). There is no significant serial correlation problem in any of these regressions.

Most spending categories exhibit significant trend effects, and in most cases the coefficient of the shift variable Time·DUM51 also is

significant. Following is a summary of these trend effects for the period following 1951 (as before, I shall only take note of coefficients from the more recent subperiod in cases where there has been a structural shift; also, I shall add the coefficients of Time and Time·DUM51 together if both are significant, so that the trend rate of change shown generally should be interpreted as that applying to 1951 and subsequent years):

TABLE 8.—SIGNIFICANT TIME TREND COEFICIENTS: NIA BUDGET EXPENDITURES, RATIOS TO POTENTIAL GNP

Equation No. and category	Percent of potential GNP at the mean, 1947–78	Time trend of ratio to potential GNP: percentage points per year
(1) Total NIA budget expenditures	18.75	0.092
(3) Nondefense purchases	2.11	.047
(4) Domestic transfer payments	4.92	.167
(6) Grants-in-aid to State and local governments	1.75	.092
(7.2) Net interest	1.33	[1].057
Subtotal: positive trends	10.11	.363
(2) Defense purchases	7.69	−.217
(5) Foreign transfer payments	.47	−.021
Subtotal: negative trends	8.16	−.238
Net trend effect		.125

[1] Since 1966 only.

Source: Appendix, table I.B.1.

We see here that the individual equation results imply a net upward trend effect for spending relative to potential GNP of .125 percentage points per year (that is, .363 minus .238), while the regression for total expenditures (equation (1)) implied a trend rise of only .092 percentage points a year. The former estimate is higher than the latter chiefly because the former reflects the reestimate of equation (7) to accommodate the effects of a structural break, and the substantial positive trend coefficient for the subperiod 1966–78 as found in (7.2). Consequently, it is probably the better summary of current circumstances. We see here that defense purchases are losing ground relative to the economy as well as in their budget share; they account for most of the total negative trend effect. Domestic transfers are the most rapidly rising category, with grants-in-aid also rising fast relative to potential GNP (according to these estimates, the trend effect is such that domestic transfer payments to persons are increasing one percentage point relative to potential GNP each six years, while grants-in-aid are rising one point each 11 years).

Total NIA expenditures show a positive but not significant cyclical response to income changes. However, certain subcategories do respond significantly, as follows:

Equation No. and Category	Regression coefficient
(2) Defense purchases	0.154
(6) Grants-in-aid to State and local governments	.017
(7.2) Net interest	.035
(4) Domestic transfers	−.074
Net cyclical effect	.132

These results are interpreted to mean e.g. that if GNP rises by one percentage point relative to potential GNP, defense purchases rise by .154 percentage points relative to potential GNP. Altogether, according to these estimates, such a one-percentage-point increase in GNP relative to potential GNP brings with it a .132 percentage-point increase in total NIA expenditure relative to potential GNP (note that this number, which is derived from the estimates of equations (2), (4), (6), and (7.2) as shown above, is almost exactly equal to the coefficient estimate for the ratio of actual to potential GNP in equation (1), the total spending equation).

In all of these regressions, all of the budget variables as well as both actual GNP and potential GNP are in current-dollar terms. Hence a significant positive coefficient estimate for the variable ΔCPI now indicates overindexing in the sense that as prices rise the budget variable in question rises by more than nominal potential GNP; therefore that budget variable gains position relative to the economy. A negative coefficient means that as prices rise the budget variable in question loses position relative to the economy.

Since the whole NIA budget shows no significant indexing effect relative to the economy, we would expect to find more or less the same variables gaining or losing position relative to the economy as gained or lost relative position in the budget as the inflation rate changed. Grants-in-aid and net interest do indeed show positive indexing in both these dimensions (their coefficients here are .0002 and .0003 respectively). However, defense purchases, whose budget share was underindexed, do not show up as being underindexed relative to the economy. And domestic transfer payments to persons, whose inflation coefficient was positive but not quite significant according to our arbitrary standard in the share regressions, here display a significant overindexing effect, with a coefficient indicating that a one-point inflation rate increase is accompanied by an increase of .05 percentage points in the ratio of domestic transfers to potential GNP.

The regression results using the functional breakdown of unified budget outlays are presented in table I.B.2.a in the appendix. We have already discussed the performance of total unified budget outlays relative to potential GNP: the only systematic force at work was found to be a linear trend, with the percentage of total outlays to potential GNP rising at a secular rate of .137 percentage points per year. There was no evidence of structural change in the relationship of total spending to potential GNP.

As before, some of the regressions for particular outlay categories displayed significant serial correlation and had to be corrected. There was also evidence of structural change in the regressions for Functions 850 and 900. Therefore the relevant equations in Table I.B.2.a are (1)–(3), (4′)–(6′), (7), (8), (9′)–(12′), (13), (14), (15′), (16), (17.1), (17.2), (18.1), (18.2), and (19′).

Following is a tabulation of significant trend coefficients from this set of equations (as before, the coefficient for Time-DUM51 is included if it is significant):

TABLE 9.—SIGNIFICANT TIME TREND COEFFICIENTS: UNIFIED BUDGET OUTLAYS, FUNCTIONAL BREAKDOWN RATIOS TO POTENTIAL GNP

Equation No. and function		Percent of potential GNP at the mean, fiscal year 1948–78	Time trend of ratio to potential GNP: percentage points per year
(1)	Total unified budget outlays	18.78	0.137
(9')	400—Transportation	.61	.017
(10')	450—Community and regional development	.14	.014
(11')	500—Education, training, employment and social services	.49	.050
(12')	550—Health	.69	.073
(13)	600—Income security	3.89	.157
(15')	750—Administration of justice	.10	.003
(18.2)	900—Interest	1.74	[1].050
	Subtotal: positive trends	7.66	.364
(2)	050—National defense	7.95	−.178
(3)	150—International affairs	.74	−.001
(14)	700—Veterans benefits and services	1.22	−.031
(16)	800—General government	.22	−.004
(17.2)	850—General purpose fiscal assistance	.12	[2]−.024
(19')	950—Undistributed offsetting receipts	−.57	−.015
	Subtotal: negative trends	9.68	−.253
	Net trend effect		.111

[1] Since 1966 only.
[2] Since 1970 only.

Source: Appendix, table I.B.2.a.

Only four of the unified budget functional outlay categories do not display a significant trend, upward or downward, relative to the economy: Functions 270, 300, 350, and 370. The other functions which have significant trends (accounting for 93.8 percent of total unified budget outlays at the mean) total 17.6 percent of potential GNP. Measured at the means, there were more dollars involved in down-trends relative to the economy than in uptrends (due almost entirely to the presence of Function 050 (National defense) among the downward trenders). However, the rate of trend change among the functions trending upward is greater in total (and in most individual cases also, with the exception of national defense), so that total unified outlays show a net upward trend. Aside from defense, the down-trend rates are very small. However, several categories of spending are rising rather rapidly on trend relative to potential GNP: Income security; health; education, training, employment, and social services; community and regional development; and (since 1970) interest (these four functions alone have a composite trend coefficient of .330, and account for about 82 percent of the total positive trend response of unified outlays). Relative to potential GNP, national defense spending has been trending downward at the rate of 1 percentage point

each four years. Income security outlays are gaining 1 percentage point each six years (the same rate as was found for NIA budget domestic transfers to persons); and Functions 450, 500, and 550 together are gaining 1 point each seven years at present trend rates.

Only three functions show significant cyclical response: Functions 600 (Income security, equation (13)), with a coefficient of −.111; 800 (General government, equation (16)), with a coefficient of .009; and 900 (Interest, equation (18.2)), with a coefficient of .035 for the period after 1965. Undistributed offsetting receipts, Function 950 and a negative receipts item, has a significant coefficient of .026. There are also only three instances of significant indexing effects: Function 350 (Agriculture), with a coefficient of −.0005; Function 850 (General purpose fiscal assistance), −.0002 since 1970; and Function 900 (Interest), .0004 since 1966.

Next we turn to the same set of particular unified outlay subfunctions as were studied in the share regressions; the present results are set out in table I.B.2.b in the appendix. No structural shifts were found here, but a few equations were reestimated due to serial correlation in the residuals. The relevant equations are (1), (2′)–(5′), (6), (7), (8′), and (9)–(14). The time trend evidence is as follows:

TABLE 10.—SIGNIFICANT TIME TREND COEFFICIENTS: UNIFIED BUDGET OUTLAYS, PARTICULAR SUBFUNCTIONS, RATIOS TO POTENTIAL GNP

Equation No. and category	Percent of potential GNP at the mean, fiscal year 1962–78	Time trend of ratio to potential GNP percentage points per year
(2′) 0.2—Retired military personnel: Subfunction 051 (part)	0.30	0.016
(6) 0.6—Elementary, secondary, higher, and vocational education: Subfunctions 501 and 502	.37	.027
(7) 0.7—Training, employment, and other labor services: Subfunctions 504 and 505	.22	.031
(8′) 0.8—Health care services: Subfunction 551	.98	.118
(9) 0.9—Social security: Subfunction 601	3.30	.096
(10) 0.10—Federal employee retirement and disability: Subfunction 602	.32	.016
(12) 0.12—Public assistance and other income supplements: Subfunction 604	.78	.043
(13) 0.13—Interest on the public debt less interest received by trust funds: subfunctions 901 and 952	1.53	.026
Subtotal: positive trends	7.80	.373
(1) 0.1—Military personnel: Subfunction 051 (part)	1.96	−.031
(3′) 0.3—National defense other than active and retired military personnel: Subfunction 051 (part)	4.74	−.151
Subtotal: negative trends	6.70	−.182
Net trend effect		.191

Source: Appendix, table I.B.2.b.

Here the subfunctions we have isolated which show significant trends involve dollars consituting 14.5 percent of potential GNP, and 77.2 percent of total unified budget outlays, at the mean. As can be seen by comparing table 10 to table 9, most of the outlays in uptrending functions identified in the regressions across functions are accounted for here in a more narrowly defined set of programs. There are a few differences, of course: in table 10 we see that outlays for military retirement are trending upward, while outlays for active military personnel and for defense other than for personnel trend dowards.[15]

[15] Note that the upward-trending subfunctions covered in table 10 are 7.80 percent of potential GNP at the mean, while the upward-trending functions included in table 9 are only 7.66 percent of potential GNP at the mean. The discrepancy is due to the fact that the regressions reported in table 10 cover data only from fiscal year 1962–fiscal year 1978, while those in table 9 cover the period fiscal year 1948–fiscal year 1978. With trends of the kind identified here at work, the mean ratio in a shorter, later period can be greater than that in an earlier, longer period even if the programs covered are fewer.

To summarize, we may infer that there exist trends in the subfunctions shown above, as well as in those functions shown in table 9 which were not split into subfunctions for the present regressions. These include Function 400, 450, and 750, as upward trenders; and 150, 700, 800, 850, and 950 as downward-trending functions. The most pronounced trend is the downward movement of national defense outlays other than for personnel, at −.15 percentage points per year relative to potential GNP. Among programs showing positive trend movement, health care services (Subfunction 551) displays the strongest trend, at .12 percentage points per year relative to potential GNP; it is followed closely by Social Security payments. We may note finally that practically the same sets of programs are identified as moving trendwise with respect to potential GNP as were found to be showing trends in budget shares (see table 6 above); the only difference is Category 0.13, interest on the public debt less interest received by trust funds, which did not have a significant trend coefficient in the shares regressions.

Several programs in this grouping show significant cyclical movement relative to potential GNP, as follows:

Equation No. and category	Regression coefficient
(1) 0.1—Military personnel: Subfunction 051 (part)	0.073
(6) 0.6—Elementary, secondary, higher, and vocational education: Subfunctions 501 and 502	.026
(11) 0.11—Unemployment compensation: Subfunction 603	−0.60
(12) 0.12—Public assistance and other income supplements: Subfunction 604	−0.38
Net cyclical effect	.001

As may be seen, the net consequence of cyclical movements of the economy on the relationship of these programs to potential GNP is almost zero. Note that the only unified budget functional categories not included here which showed significant cyclical sensitivity in the previous set of regressions were Function 800 (General government), which displayed a cyclical coefficient of .009; and Function 900 (Interest), with a coefficient of .035 since fiscal year 1965. On this evidence, then, there is a net cyclical effect of .045, which is rather small. This is consistent with the earlier finding for total unified budget outlays relative to potential GNP (table I.B.2.a, equation (1)) of no significant cyclical response.

Spending categories 0.1 and 0.6 have significant positive price-index responses, with coefficients of .066 and .022 respectively (that is, a one-point rise in inflation would for example be associated with a change of .066 percentage points in the ratio of spending for Category 0.1 to potential GNP).

Lastly, we turn to the outlay variables which are available as part of the relatively controllable-relatively uncontrollable categorization made by the Office of Management and Budget. These categories, it will be recalled, are of interest in that they cover particular programs and that data on some of them are available over the whole period fiscal year 1948-fiscal year 1978, whereas data on the subfunctions just analyzed are available only since fiscal year 1962.

The relevant results are reported in table I.B.2.c in the appendix. Both structural shifts and autocorrelation are in evidence, requiring the reestimation of some equations. The relevant equations for our

discussion turn out to be (1′), (2.1,) (2.2), (3), (4), (5′), (6′.1), (6′.2), (7.1), and (7.2). Following is a summary of the trend coefficient estimates which were significantly different from zero:

TABLE 11.—SIGNIFICANT TIME TREND COEFFICIENTS: UNIFIED BUDGET OUTLAYS, CONTROLLABLE-UNCONTROLLABLE CATEGORIZATION, RATIOS TO POTENTIAL GNP

Equation No. and category	Percent of potential GNP at the mean, fiscal year 1948–78	Time trend of ratio to potential GNP: percentage points per year
(1′) U.1—Social security and railroad retirement payments	2.48	0.125
(2.2) U.2—Federal employee retirement and insurance payments, including military	.45	.026
(5′) U.5—Medicare and medicaid	.47	.064
(6′.2) U.6—Housing payments	.05	[1].012
Subtotal: positive trends	3.45	.227
(4) U.4—Veterans benefits	.95	−.026
Subtotal: negative trends	.95	−.026

[1] Since 1970 only.

Source: Appendix, table I.B.2.c.

This is an incomplete list (recall that data since fiscal year 1948 are not available for more than a few of the categories in the controllable-uncontrollable tabulation), but it tends to confirm the results of the subfunction regressions. Social Security and Federal retirement payments are shown to be trending upward somewhat faster than in those regressions (where their trend coefficients were .096 and .016 respectively—see table 10); while Medicare and Medicaid are rising trendwise more slowly here than health care services do in the subfunction regressions (where the trend coefficient is .118). In this connection, it should again be noted that the regressions summarized in table 11 are based on data over the period fiscal year 1948–fiscal year 1978, while the table 10 regressions cover only fiscal year 1962–fiscal year 1978. On that basis, it is not surprising that the latter regressions show a larger trend coefficient for a program like health care services than is found in the former ones.

Just as in the budget share regressions, Category U.7 (Public assistance programs) fails to show a consistent trend, strengthening the earlier conclusion that the trend found in the subfunction regressions may have been due to the failure of those regressions to catch the structural shift that seems to have occurred in this variable's relationship to the budget and to potential GNP. As before, it is difficult to compare these results closely with the previous ones because of differing definitions.

Categories U.2 (Federal retirement, including military), U.3 (Unemployment assistance payments), and U.7 (Public assistance payments) all show negative sensitivity to the business cycle, though the effects are not large (for U.3 and U.7, a 1-percentage-point rise in the ratio of actual to potential GNP will cause their respective positions relative to potential GNP to fall by about .07 percentage points; while the position of U.2 would fall by .01 percentage point). Finally, a small underindexing effect is found for Category U.7 since 1970; with its coefficient of −.0003 meaning that a 1-percentage-point rise in the inflation rate will reduce the relationship of public assistance payments to potential GNP by .03 percentage points.

(3) TAX RESULTS: BUDGET SHARES

Tables II.A.1–II.B.2 in the appendix summarize the statistical results obtained by applying our analytical framework to tax revenues under the two budget concepts. We note here that these regressions differ in format from the spending regressions only in that they have just one dummy variable—"DUM64"—with value of zero up to 1964 and unity in 1964 and beyond. This dummy multiplies the time trend variable; that is, it allows the coefficient of the trend variable to become larger or smaller in 1964 and after than it was in the pre-1964 period. It represents the shift in the structure produced by the 1964 change in the tax law, a change which was effected largely by changing tax rates. Dummies inserted for other tax law changes failed to reach significance and were deleted.

It will be convenient to discuss the NIA and unified budget results together, since there are many fewer categories to examine than there are on the spending side. First we look at the behavior of budget shares. The results of these regressions appear in the appendix, in tables II.A.1 (NIA budget) and II.A.2 (unified budget). Following is a summary of the significant trend coefficients from these estimates. Because of autocorrelation problems, the equations for indirect business taxes in the NIA budget regressions, and for excise and gift taxes in the unified budget regressions, were reestimated. No structural changes were found in any of the estimates. Therefore the relevant equations in the NIA budget set (table II.A.1 in the appendix) are (1), (2), (3′) and (4). In the unified budget set (table II.A.2), the relevant equations are (1)–(4), (5′), and (6)–(8). The trend coefficients shown include the coefficient of Time. DUM64 if that coefficient is statistically significant.

TABLE 12.—SIGNIFICANT TIME TREND COEFFICIENTS: NIA BUDGET RECEIPTS, BUDGET SHARES

Equation No. and category	Percent of total receipts at the mean, 1947–78	Time trend of share: Percentage points per year
(1) Personal taxes and nontax receipts	44.66	0.237
(4) Contributions for social insurance	20.33	.641
Subtotal: positive trends	64.99	.878
(2) Corporate profits tax accruals	22.35	−.375
(3′) Indirect business tax and nontax accruals	12.66	−.474
Subtotal: negative trends	35.01	−.849

Source: Appendix, table II.A.1.

TABLE 13.—SIGNIFICANT TIME TREND COEFFICIENTS: UNIFIED BUDGET RECEIPTS, BUDGET SHARES

Equation No. and category	Percent of total receipts at the mean, fiscal year 1978–79	Time trend of share: Percentage points per year
(1) Individual income taxes	43.80	0.269
(3) Social insurance taxes and contributions	18.87	.677
(6) Custom duties	1.16	.013
(7) Deposit of earnings by the Federal Reserve System	1.04	.041
Subtotal: positive trends	57.87	1.000
(2) Corporation income taxes	21.78	−.409
(4) Excise taxes	11.34	−.572
Subtotal: negative trends	33.12	−.981

Source: Appendix, table II.A.2.

The significant movements in shares that show up in these regressions are very similar as between the two budgets. The share of personal income taxes trends upwards in both budgets at the rate of about one quarter of a percentage point per year. (It is interesting to note that the level of explanation of the personal income tax equation in both of the share regressions is very low: the R^{-2} is .091 in the NIA budget regression and .289 in the unified budget regression. Apparently there is a good deal of random fluctuation in the share of personal taxes. Nevertheless, the time trend is clearly significant in both regressions.) The share of social insurance revenues trends upward at a very fast rate: about two-thirds of a percentage point per year in each budget (note that in 1978 these taxes were 30.7 percent of NIA budget receipts and 32.2 percent of unified budget receipts—far above the respective mean values of 20.3 percent and 18.9 percent respectively).

On the other hand, the share of corporate profit taxes is falling at a trend rate of about .4 percentage points per year, and excise taxes fall at about .6 percentage points annually in terms of budget share. Clearly, steady and substantial shifts are occurring in the pattern of tax receipts, and these shifts have been going on during the whole postwar period, according to this evidence.

There is a fair amount of cyclical sensitivity in tax shares. Following is a tabulation of these coefficients for the two budgets:

Equation No. and category	Regression coefficient
NIA budget:	
(2) Corporate profit tax accruals	0.394
(3′) Indirect business tax and nontax accruals	−.249
(4) Contributions for social insurance	−.298
Unified budget:	
(2) Corporation income taxes	.416
(3) Social insurance taxes and contributions	−.239
(4) Excise taxes	−.317

In neither budget does the personal income tax receipts share achieve a significant cyclical coefficient, though in both cases the estimated coefficient is positive. The corporate tax share is estimated to rise about .4 percentage points when actual GNP rises 1 percentage point with respect to potential GNP, in both budgets. The share of social insurance contributions falls when income rises relative to potential, as does the share of indirect business taxes (and of all the indirect taxes shown in the unified budget accounts, though only the excise tax coefficient is significant).

Regarding indexing, the share of indirect taxes is underindexed and the share of social insurance taxes overindexed in the NIA budget accounts: the two effects (table II.A.1, equations (3′) and (4)) almost exactly match each other in size (share changes of −.18 and .19 percentage points respectively in connection with a 1-percentage-point change in the inflation rate). Very similar effects show up in the unified budget results (table II.A.2, equations (3) and (4)): only the shares of social insurance and excise tax receipts show significant indexing response, with the former's share rising .14 percentage points, and the latter's falling .15 percentage points, in response to a one-point rise in the CPI inflation rate.

(4) TAX RESULTS: RATIOS TO POTENTIAL GNP

Regression results for the movements of tax collections relative to potential GNP are given for the two budgets in tables II.B.1 and II.B.2 in the appendix. In the NIA results, there was evidence of a structural change following 1965 in the social insurance equation; also, the indirect business tax equation had to be reestimated due to the presence of significant autocorrelation in the residuals of the original estimate. Consequently, the relevant NIA budget equations from table II.B.1 are (1)–(3), (4′), (5.1), and (5.2). There was no break found in the unified budget regressions, but two equations needed correction for autocorrelation. Thus the relevant unified budget equations from table II.B.2 are (1)–(4), (5′), (6′), and (7)–(9). Following is a summary of the significant trend coefficients found in each of these budgets:

TABLE 14.—SIGNIFICANT TIME TREND COEFFICIENTS: NIA BUDGET RECEIPTS, RATIOS TO POTENTIAL GNP

Equation No. and category	Percent of potential GNP at the mean, 1947–78	Time trend of ratio to potential GNP: percentage points per year
(1) Total NIA budget receipts	18.41	0.200
(2) Personal taxes and nontax receipts	8.23	.129
(5.2) Contributions for social insurance	3.78	[1].184
Subtotal: positive trends	12.01	.313
(3) Corporate profits tax accruals	4.10	−.001
(4′) Indirect business tax and nontax accruals	2.30	−.061
Subtotal: negative trends	6.40	−.062
Net trend effect		.251

[1] Since 1966 only.

Source: Appendix, table II.B.1.

TABLE 15.—SIGNIFICANT TIME TREND COEFFICIENTS: UNIFIED BUDGET RECEIPTS, RATIOS TO POTENTIAL GNP

Equation No. and Category	Percent of potential GNP at the mean, fiscal year 1948–78	Time trend of ratio to potential GNP: percentage points per year
(1) Total unified budget receipts	17.99	0.211
(2) Individual income taxes	7.89	.135
(4) Social insurance taxes and contributions	3.42	.149
(7) Custom duties	.21	.004
(8) Deposit of earnings by the Federal Reserve System	.19	.009
Subtotal: positive trends	11.71	.297
(3) Corporation income taxes	3.90	−.001
(5) Excise taxes	2.01	−.068
Subtotal: negative trends	5.91	−.069
Net trend effect		.228

Source: Appendix, Table II.B.2.

Here again the results are very similar as between the two budgets. Both estimates show the trend ratio of personal income taxes to potential GNP rising by .13 percentage points per year, and a miniscule trend reduction in the ratio of corporate profit taxes to the economy.

The personal income tax equations perform better here than in the budget share regressions, with about two-thirds of the variance of the dependent variable explained in each of the two equations. The rates of change of social insurance tax receipts differ somewhat in the two estimates, but that is because the NIA estimate shown for that variable covers only the period 1966–78 due to the finding of a structural break following 1965. The original NIA estimate over the whole postwar period (equation (5)) produced a trend coefficient of .151, almost identical to the unified budget estimate.

The net trend effect calculated from the significant trend coefficients for individual tax categories in both budgets is positive, and comes out to be .25 percentate points per year for the unified budget data. These figures are slightly higher than the trend coefficients of .20 and .21 from the total receipts equations. The difference reflects the fact that in both budgets the basic corporate profits trend coefficient, which was negative, was not significant (though the coefficient of Time·DUM64 was significant in both cases), and that several of the unified tax categories displayed negative but insignificant trend coefficients. But the differences are not large, and it would probably be fair to conclude that tax revenues as a percentage of potential GNP are trending upward at a rate of between .20 and .25 percentage points per year.

Next we examine the cyclical sensitivity of revenues relative to potential GNP. Following is a summary of the significant coefficients:

Equation No. and category	Regression coefficient
NIA budget:	
(1) Total receipts	0.477
(2) Personal taxes and nontax receipts	.243
(3) Corporate profits tax accruals	.185
(4') Indirect business tax and nontax accruals	.020
(5.2) Contributions for social insurance	[1] .100
Net cyclical effect	.548
Unified budget:	
(1) Total receipts	.487
(2) Individual income taxes	.245
(3) Corporation income taxes	.197
(7) Custom duties	.003
Net cyclical effect	.445

[1] Since 1966 only.

The cyclical response shown by personal income and corporate income tax receipts is practically the same in the two budgets: an increase of one-fourth of a percentage point in the ratio of personal tax collections to potential GNP accompanies a 1-percentage-point rise in the ratio of actual to potential GNP. The comparable corporate tax figure is about two-tenths of 1 percentage point. Contributions for social insurance just miss significance in the unified regression (this variable's cyclical coefficient is .030, with a t-ratio of 1.97), while in the NIA regression this equation (5) shows a structural break after 1965. We may note that the NIA social insurance regression for the whole period 1947–78 produces a cyclical coefficient of .028 with a t-ratio of 1.74—essentially the same as the corresponding unified

budget regression. (Note the discussion of the trend coefficients above, where similar comparisons between whole-period NIA budget and unified budget regressions are made).

Finally, total receipts show significant evidence of overindexing in the NIA regression (with a coefficient of .0015), and almost significant evidence of overindexing in the unified budget regression. In the NIA budget, personal income tax receipts and social insurance tax receipts display significant over indexing; no tax program is shown to be underindexed. The same qualitative result holds for the unified budget—though the numbers are slightly different, as shown in the following tabulation which gives the percentage-point change in the ratio of each program to potential GNP given a 1-percentage-point rise in the CPI inflation rate:

	NIA budget	Unified budget
Personal income tax receipts	0.082	0.061
Social insurance receipts	.064	.039

4. Summary and Conclusions

The purpose of this paper is to test for the presence of trend effects which have influenced the budget's composition and its position relative to the economy. The procedure used in these tests involved the application of a statistical regression technique to separate these secular effects from the effects of others systematically operating influences (cyclical forces, price indexing), known one-time phenomena (the Korean war spending acceleration, particular tax changes), and random elements. The trend effects which have been found in the various budget categories, as documented in this paper, obviously summarize the trends which are present in particular programs. Presumably these could also be identified in a detailed, program-by-program study of the budget, in which the effects of such factors as demographic shifts, changes in entitlement provisions, and so on, could be studied carefully for each program. Such a detailed approach was infeasible, given the time constraints and the availability of other resources. Instead, the supposition being investigated in this paper is that an underlying set of social, economic, political, demographic, and other forces taken together is exerting a continuing, systematic secular influence on the budget's composition and size.

The degree to which particular programs, or at least particular spending or tax categories, are affected is found via regression analysis rather than by the study of the provisions particular to individual programs, and is summed up in the trend coefficient for each category. When the cyclical, one-time, and random influences had been accounted for, it was indeed found that a very large part of the budget has been affected by trends. Where budget shares were concerned, all of the NIA expenditure and tax categories showed significant trend movements up or down, while under the somewhat more detailed unified budget, 10 of the 17 functional spending categories (covering 91.4 percent of outlays at the mean) and 6 of 9 tax categories (covering 91.0 percent of receipts) show significant trend effects. Similar statements can be made for results related to growth in the budget's size

relative to the economy. In regressions involving ratios of the budget and its components to potential GNP, all NIA expenditure and tax categories, as well as total NIA expenditures and receipts, have trend effects in evidence. Among the 17 unified budget outlay categories, 12 of them plus undistributed offsetting receipts show significant trends. Compared to the ratio of total unified outlays to potential GNP (which itself shows a trend) of 18.8 percent at the mean, the spending in these categories amounts to 17.3 percent of potential GNP at the mean. On the tax side, total unified receipts are 18 percent of potential GNP and show a trend. Six of the nine receipt categories, amounting to 17.6 percent of potential GNP at the mean, display trend effects. Thus such effects are very pervasive throughout the whole budget.

In section 3 of this paper, the specific findings have been presented and reviewed in considerable detail. Here I shall attempt to present the overall picture and its implications by summarizing which spending and which tax categories display upward and which display downward trends, and the strengths of these trends. In drawing all of this together, it is important to be aware of two things. First, the patterns which are being discussed are a characterization of a certain historical period as revealed by a particular statistical structure. The findings for this historical period will not necessarily carry forward into the future: for example, changes in the features of important programs could alter the patterns considerably. And how well reality, in the historical period covered, is being described depends also on the adequacy of the statistical framework used. Does it do a good job? Certainly the structure adopted here is very simple—but, as long as it "explains" reality well and is logically consistent internally, most economists would in general prefer a simpler explanatory structure to a more complicated one. Looking at the results, one would have to give the present approach high marks on the basis of the usual statistical criteria. Second, given the structure and the historical period, the results are subject to error, as measured for example by the standard error of estimate for each of the regression equations and by the standard errors of individual coefficients. While the numerical estimates reported in this paper satisfy a set of statistical criteria for "best" estimates, and are certainly the numbers one would tend to cite if asked for point estimates of the effects of the phenomena studied, their exact values should not be taken too literally. Rather, it should be understood that they lie within a range of reasonably likely values, with the dimensions of this range indicated by, e.g., the standard errors of the coefficients.

a. Trend Effects

(1) BUDGET SHARES

Regarding composition of the budget, both budget measures tell similar stories concerning both spending and taxes, with more details available from the unified budget results. Total military spending is trending downward as a component of both budgets, and at a rather rapid rate. However, the more detailed unified budget data show that this general result masks divergent trends in military retirement pay and other military outlays. The budget share of payments to military retirees is trending upward (and so is the share composed of payments

to nonmilitary-retired-Federal employees). The military-retiree-pay-share-trend rate is .074 percentage points per year, and the nonmilitary-Federal-retirement-outlays share-trend rate is .066 percentage points. The share of national defense spending other than military retirement has been falling at a rate of 1.45 percentage points annually, based on subfunction estimates over fiscal year 1962–fiscal year 1978.

The most strongly upward-trending categories in terms of budget shares are the various transfer programs. Among NTA expenditures, the share of domestic transfers plus that of grants-in-aid to State and local governments has been rising at a combined rate of 1.17 percentage points per year. Among unified budget outlays, the share of Functions 500, 550, and 600 have been increasing at trend rates of .23, .34, and .69 percentage points per year respectively, for a combined increase rate of 1.26 points per year. Thus the growth in these functions plus the two retirement programs already mentioned has been almost exactly offsetting the relative decline of nonretirement military outlays. However, the available subfunction data, and data on the relatively controllable-relatively uncontrollable categories, enable us to examine budget trends in even more detail. Within Functions 500, 550, and 600, the Subfunctions of importance are 501—502 (Elementary, secondary, higher, and vocational education), 504 – 505 (Training, employment, and other labor services), 551 (Health care services), 601 (Social Security), and 604 (Public assistance); these constituted 90.3 percent of the outlays in Functions 500, 550, and 600 in fiscal year 1978. Their combined trend coefficient is estimated to be 1.44 percentage points per year (that is, their combined share of unified budget outlays has been increasing at a trend rate of 1.44 percentage points per year as compared to the 1.26-point rate for their parent functions; as of fiscal year 1978, the combined share stood at 43.3 percent of total outlays). Looking at even more detailed data from the controllable-uncontrollable classification), especially rapid trend growth relative to the whole budget is shown by the Medicare and Medicaid programs, which constitute most of Subfunction 551. These have a share trend coefficient of .76 percentage points annually since 1970 (the share of Subfunction 551 total grew trendwise at .56 percentage points per year since 1962).

The story concerning trends in the budget shares of various tax programs is quite simple. The share of social insurance taxes has been rising steadily at a rate of two-thirds of a point annually, while personal income taxes have been increasing their share by one-fourth of a percentage point per year. The losers in share terms have been corporate taxes and indirect taxes.

Thus there clearly exist strong trend movements in the composition of both sides of the budget. However, there is another dimension to be considered: The budget tends to vary systematically in relationship to the economy. We next summarize the findings on this aspect.

(2) RATIOS TO POTENTIAL GNP

We begin by examining the movements of expenditures and receipts taken as totals. As will be recalled, we measure budget growth relative to the economy by working with ratios of expenditures and tax receipts to potential GNP, or "the economy". The regression for total NIA

spending relative to potential GNP shows a significant positive trend coefficients with a value of .092. However, by summing the significant trend coefficient across individual spending category regressions, we obtain a net coefficient value for the trend term of .125. The difference lies chiefly in the fact that the latter figure, but not the former, incorporates a structural shift: at the end of 1965, according to our estimates, the net interest trend coefficient changed from a value insignificantly different from zero to .057, thus increasing the trend rate of growth of total expenditures. The .125 figure suggests that, since 1965, NIA outlays have been rising relative to potential GNP by 1 percentage point every 8 years; before that, the rate was much slower—the estimate for the earlier years is .092 points per year, representing a relative increase of 1 percentage point about every 15 years.

Receipts in the NIA budget have shown a considerably more rapid trend upward relative to the economy than have expenditures, with significant trend coefficients for individual tax categories summing to .25, just twice the expenditure sum. The regression for total NIA receipts has a trend coefficient of .20, but there also was a structural shift not reflected in this figure; this time it is a sharp increase in the trend response of social insurance contributions, from .128 before 1966 to .184 points thereafter. The net trend coefficient of .25 indicates that NIA receipts are presently rising trendwise 1 percentage point relative to potential GNP each four years.

The unified budget results are not very different. Unified outlays show a combined trend response of .11 percentage points per year relative to the economy, suggesting that total outlays under this concept have risen 1 percentage point every nine years as a fraction of potential GNP. Again, an increase in the interest rate trend response as of 1965 was found, of practically the same size as in the NIA results. Unified receipts trend upward at a rate of about .23 percentage points per year.

Among the particular NIA expenditure categories, each one except "other expenditures" shows evidence of significant trend movement relative to the economy. Defense purchases have trended downward strongly in this dimension, as well as in share, losing 1 percentage point of position vis-a-vis potential GNP each five years or so. Domestic transfer payments to persons and grants-in-aid to State and local governments have been the strongest gainers, with the former rising 1 percentage point on potential GNP each 6 years, and the latter 1 point about each 11 years.

Interest payments began to trend upward relative to the economy in the mid-1960's in both the NIA and unified budgets. On the other hand, interest payments have the interesting property of displaying downward trends as a share of both budgets. In the unified budget, military payments for active personnel and for purposes other than personnel are trending downward relative to the economy at .18 percentage points per year (or 1 percentage point every 5½ years). Retired military pay plus Federal nonmilitary retirement payments together are trending upward at .03 percentage points annually relative to the economy. But the strongest trends have been shown by health care services and by income security payments. Since 1962, the former (reflecting mostly Medicare and Medicaid growth) have risen at .12 percentage points annually relative to potential GNP

(a rate of 1 point each 8½ years) while Social Security plus public assistance and other income supplement payments have been increasing .139 point per year on the economy (1 point each 7 years).

Trend changes in the importance of particular tax categories relative to the economy are dominated by social insurance receipts, which have been trending upward by about .18 percentage points per year in ratio to potential GNP. The personal income tax trend rate has been .13 percentage points annually, while indirect taxes have been declining relative to the economy at a trend rate of about .07 points annually.

b. Cyclical Effects, Price-Indexing Effects, and Stability of Results

The remaining systematic evidence in this paper is concerned with cyclical and price-indexing responses of budget shares and the position of the budget relative to the economy, and finally with the stability of the whole structure. In terms of budget shares, most of the cyclical action is in Function 600 (Income security), which shows a cyclical response coefficient of about —.7 in the functional regressions and only slightly smaller coefficients in the more detailed regressions (this number means that, if the ratio of actual to potential GNP rises by 1 percentage point, e.g. from .97 to .98, the ratio of Function 600 outlays to total budget outlays would fall by .7 percentage points). There is some evidence of procyclical movement in the share represented by payments to active military personnel (it has a cyclical coefficient of .20 in the subfunction fits; and defense spending shows a cyclical response of .37 in the NIA shares regressions). In the results for ratios to potential GNP, there is evidence of slightly more widespread cyclicality, as interest payments (in both budgets, each with a procyclical coefficient of .035) and grants-in-aid (in the NIA figures, with a procyclical .017 coefficient) also show up. The net cyclical effect estimated for the whole spending budget relative to the economy is .13 for the NIA version and —.04 for the unified one. The difference is that the NIA figures produce a significant defense-spending cyclical response of .15, while the cyclical sensitivity of military spending in the unified budget (Function 050) is positive but insignificant (coefficient of .17 with a t-ratio of 1.79, though the military personnel subcategory shows a significant procyclical movement). It may very well be due to the differences in timing between the two budgets in recording outlays. Since the NIA procedure is aimed more closely at recording expenditures in such a way as to reflect their economic impact, perhaps the NIA results are the more accurate in this case. If we take this line, the spending evidence shows roughly the following important cyclical responses: Defense spending, .15; net interest, .035; unemployment compensation, public assistance, etc., —.10; all in relation to potential GNP.

There is a good deal of cyclical response by tax revenues, both as to budget shares and in relation to the economy. The share of personal income taxes is not affected, but the corporate tax share moves procyclically with a response coefficient of .4. The shares of social insurance contributions and indirect taxes move countercyclically (coefficients of about —.25 to —.30 for each one). Relative to potential GNP, all of the significant cyclical responses are positive. The more

important response coefficients are as follows: Personal income taxes, .25; corporate profits tax, .20; social insurance contributions, .10.

While several spending categories show weak price-indexing effects in various regressions, there are a few which show it consistently, with interest payments being the most noticeable. The interest share rises by about .12 percentage points when inflation accelerates by 1 point; and this also causes interest payments to rise by about .03 percentage points relative to the economy. Payments for education under Subfunctions 501 and 502 also increase their share (.10) and their position in relation to the economy (.02) in response to a 1-point inflation increase. The following tabulation, giving the share or ratio-to-potential GNP change in the particular category in response to a 1-point inflation acceleration, is a convenient summary of all of the significant price-indexing effects found.

Spending categories	
Budget shares:	
NIA grants-in-aid	+.08
NIA net interest	+.13
Unified Fn. 800	+.04
Unified Fn. 900	+.12
Unified Subfns. 501+502	+.10
Unified Subfns. 504+505	−.07
Unified Fn. 300	−.04
Unified Fn. 350	−.01
Ratios to potential GNP:	
NIA grants-in-aid	+.02
NIA net interest	+.03
NIA domestic transfers	+.05
Unified Fn. 900	[1] +.04
Unified Subfn. 0.1	+.07
Unified Subfn. 0.6	+.02
Unified Fn. 350	−.05
Unified Fn. 850	[2] −.02
Unified Subfn. U.7	[2] −.03
Tax categories	
Social insurance	+.14 to +.19
Indirect taxes	+.15 to +.18
Total receipts	+.09 to +.15
Personal income	+.06 to +.08
Social insurance	+.04 to +.06

[1] Since 1966 only.
[2] Since 1970 only.

Finally, a word needs to be said regarding the stability of these estimates and of the underlying budget relationships. To what extent have there been noticeable changes in the structure as identified by the Chow tests done on each estimate? Are we in a "new ball game" regarding the budget in the 1970's relative to earlier years?

A glance through the tables in section 3 shows evidence of some structural shifts scattered here and there throughout the whole set of results. In some cases, shifts have occurred in quite insignificant categories, as in equation (6′), table 7, covering housing payments, which amount to only .25 percent of outlays.

Yet there are at least a few structural changes worth noting. In the share equations, military personnel outlays increased its rate of decline threefold in 1970 and later (table 6, equation (1)). Medicare and Medicaid payments showed a marked increase in their budget share trend coefficient in the mid-1960's; but this is certainly not surprising since the first outlays under this pair of programs were recorded only

in 1961. In the ratio-to-potential GNP equations, interest payments in both budgets showed a sizeable trend increase in the mid-1960's, as has already been noted. Among taxes, NIA social insurance contributions relative to potential GNP show a shift after 1965 from a trend coefficient of .13 to 1 of .18 percentage points per year (though the unified budget estimate gives a trend sensitivity of .15 percentage points for the whole period). But this is really all—there are only one or two important structural shifts which show up. These estimates display a quite remarkable degree of overall stability; the structure imposed a priori has indeed captured most of the systematic movement that has occurred (of course, the dummy variables included in this structure had already accommodated several anticipated structural shifts).

Let us close by attempting to draw a few inferences from this mass of results and interpretations, especially as regards the present budget position and the possibilities for fiscal policy in the future.

The point of this exercise was to strip away the shorter run influences on the budget of cyclical phenomena, inflation, and the effects of particular events; and to lay bare the longrun factors at work, characterized here as "trend effects." We have found significant evidence that such effects, which we attribute to the operation of a set of ongoing social, political, economic, demographic, and other pressures, are indeed present in almost all dimensions of the budget, and are reflected both in substantial longrun changes in the composition of spending and revenue and in the increased size of the budget relative to the economy.

Our estimates showed that trend-dominated categories constituted 90 percent or more of the budget over the period 1947–78, and that spending under each budget version shows a net upward trend relative to potential GNP of about one-eighth of a percentage point per year. (This figure would be almost two-fifths of a point per year had military purchases not been trending downward so strongly during the period.) We have also found that programs dominated by rising trends have increased very significantly their fraction of the budget. For instance, outlays in unified budget functions 450, 500, 550, and 600 constituted 50.4 percent of total budget outlays in fiscal year 1978 as compared to a total of 26.8 percent at the period mean. Further, outlays in just these four categories were 10.5 percent of potential GNP in fiscal year 1978 as compared to 5.2 percent at the mean for the period—and of course potential GNP itself has been growing steadily.

These gains have by no means been offset totally by downward-trending programs. National defense outlays (Function 050), which display by far the strongest downward trend, were 4.9 percent of potential GNP in fiscal year 1978, as compared to 8.0 percent at the mean. A very likely consequence is that flexibility in budgeting is lost. Given the level of revenue, there result fewer options for new initiatives. Possibly desirable new programs may in a sense be "crowded out" as the upward-trending ones leave less and less room. As it has happened, of course, tax revenues themselves have been growing. One of our interesting results above was that in trend terms, tax revenues have recently been rising much faster than outlays, while both have been growing relative to the economy. Other things equal, such revenue growth can provide space for new programs, for the expansion of old ones, or for other possibilities. However, it will also continuously expand the government sector relative to the rest of the economy if

devoted to program enlargement or to increasing the number of programs.

One should not conclude that these phenomena are necessarily bad. The economic, social and other underlying forces mentioned earlier embody changing views regarding the proper size of the government sector, the need for welfare programs, etc. The important issue is whether the trends we have measured were fully anticipated at the time the programs were initiated. This question has not been addressed directly in this paper, but it is of some relevance to note that the unified budget outlay categories which show the strongest trend growth are those driven by expenditures labeled as "relatively uncontrollable." Among these are, e.g., Social Security and Railroad Retirement, Federal employee retirement, Medicare and Medicaid, and housing payments. The ratio of these taken together to potential GNP was 7.1 percent in fiscal year 1978, which is slightly more than double the ratio of 3.45 percent found at the mean.

At the beginning of this paper, we raised the question: Why has the economy moved from a position of budget balance (at least in longrun or cumulative terms) to what seems to be a new situation of chronic and rather large deficits? Did something change in the 1960's to bring this about? If taxes are growing so much faster than outlays, why is the budget not in surplus?

There are several dimensions to this question. There were some important specific changes in the 1960's on the spending side: for example, the expansion of the Medicare-Medicaid program from zero outlays in the early 1960's to annual outlays of more than $40 billion presently; programs initiated in the 1960's under the "War on Poverty" which have involved large expenditures, etc. Another is the sharp increase in interest outlays which began in the mid-1960's. But these changes are not numerous, and it is also important to realize that the trend phenomena which have been the focus of most of the present discussion are only one of several systematic factors at work. In addition to trend effects, the budget responds fairly sensitively to cyclical movements in the economy: when actual GNP falls relative to its full-employment or potential level, tax revenues fall sharply (we found significant procyclical responses of personal, corporate, and social insurance tax revenues) while unemployment assistance and other transfer programs expand; this is all quite independent of the trends. It is a combination of all these factors—some structural changes with negative implications for the budget's position, negative cyclical effects during at least parts of the 1970's, plus the effects of inflation on interest payments and certain other classes of expenditures—which accounts for our recent experience.

In closing, it is important to stress that we as a society are not necessarily committed to a continuation of the forces which have been identified here, nor is this particular paper intended to be interpreted explicitly or implicitly as advocating the expansion or contraction of any particular program or programs. The analysis has been devoted to an examination and quantification of what has happened; it has nothing to say about what should happen or what is going to happen in the future. Its motivation was the notion that, by separating and measuring these various influences, we hopefully will be better able to discuss the underlying issues intelligently and to make informed choices and decisions.

Appendix Tables

TABLE I.A.1.—NIA BUDGET EXPENDITURES, CALENDAR YEARS 1947–78: BUDGET SHARES

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 51	$\Delta CPI_{t-1/2}$	DUM 72	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,22)	Chow Test Statistic: Break Following 1969 F(4,22)	Auto-regressive Parameter
(1)	E.Def/E	25.90330	0.37531	−0.013311	0.000160	−0.00285	−0.02747	0.973	0.0208	0.4112	1.42	2.388	0.651	
		(17.31830)	(2.61430)	(−17.657600)	(19.167800)	(−2.16001)	(−1.86970)							
(2)	E.Nondef/E	−3.82164	.06482	.002004	−.000034	−.00004	−.01787	.448	.0167	.1134	1.39	1.497	.394	
		(−3.19631)	(.56501)	(3.326910)	(−5.051210)	(−.03859)	(−1.52201)							
(3)	E.DomTr/E	−13.78080	−.46831	.007425	−.000025	.00219	.03486	.948	.0186	.2591	1.94	.133	.183	
		(−10.34040)	(−3.66195)	(11.057100)	(−7.051020)	(1.86515)	(2.66321)							
(4)	E.ForTr/E	2.32937	−.01030	−.001140	−.000032	−.00038	−.00572	.881	.0100	.0279	2.05	.139	.108	
		(3.25411)	(−.15002)	(−3.159380)	(−7.951070)	(−.59467)	(.81401)							
(5)	E.Grants/E	−8.48247	.05084	.004355	−.000017	.00081	.01828	.983	.0055	.0904	1.11	1.526	5.754	
		(−21.61580)	(1.35013)	(22.021300)	(−7.902940)	(2.34811)	(4.74247)							
(6)	E.NetInt/E	.39325	.01779	−.000155	−.000022	.00125	.00030	.894	.0058	.0727	9.58	2.165	1.551	
		(.93974)	(.44300)	(−.735970)	(−9.551270)	(3.38269)	(.07172)							
(7)	E.other/E	−1.54698	−.03015	.000822	−.000003	−.00099	−.01381	.376	.0068	.0254	1.03	*6.480	3.371	
		(−3.16268)	(−.64230)	(3.334760)	(−.919950)	(2.28851)	(−2.87459)							
1947–65: (7.1)	E.other/E	−3.66091	−.03904	.001908	−.000005	−.00001	.00285	NA	NA	NA	NA			
		(−4.86220)	(−.70656)	(5.144480)	(−2.039810)	(−.03249)	(.47796)							
1966–78: (7.2)	E.other/E	2.42848	−.01198	−.001205	−.000005	−.00115	.00285	NA	NA	NA	NA			
		(1.04843)	(−.09690)	(−1.063370)	(−2.039810)	(−.89897)	(.47796)							

*Significant at 5 percent level.

NA—Not available.

TABLE I.A.2.a.—UNIFIED BUDGET FUNCTIONAL OUTLAYS, FISCAL YEARS 1948–78: BUDGET SHARES

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 51	$\Delta CPI_{t-1/2}$	DUM 73	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,21)	Chow Test Statistic: Break Following 1969 F(4,21)	Auto-regressive Parameter
(1)	U0.050/U0	23.91640	0.36030	−0.012300	0.000174	−0.00035	−0.03810	0.905	0.0388	0.4224	1.77	0.317	0.042	-------
		(8.93550)	(1.28950)	(−9.167050)	(10.032100)	(−.13614)	(−1.38252)							
(2)	U0.150/U0	2.10408	.00327	−.001010	−.000044	.00105	−.00940	.874	.0127	.0424	.186	1.240	.771	-------
		(2.39911)	(.03573)	(−2.304570)	(−7.703583)	(1.25979)	(−1.04107)							
(3)	U0.250/U0	−4.07877	.15542	.002020	−.000038	−.00372	−.02372	.555	.0100	.0145	.47	*17.640	3.525	-------
		(−5.91549)	(2.15926)	(5.849500)	(−1.867730)	(−1.09888)	(−3.34194)							
(4)	U0.270/U0	.05590	−.00884	−.000020	−.000001	.00316	.00194	.305	.0019	.0059	.70	3.571	†8.672	-------
		(.42150)	(−.63834)	(−.396820)	(−1.455320)	(1.27753)	(1.42135)							
(5)	U0.300/U0	−.01294	−.01239	.000028	−.000006	−.00312	.00432	.484	.0032	.0197	1.01	.620	.504	-------
		(−.05810)	(−.53289)	(.247930)	(−3.875983)	(−.56452)	(1.88468)							
(6)	U0.350/U0	−.49844	−.11929	.000342	−.000010	−.00286	−.01229	.443	.0114	.0256	1.80	.753	.137	-------
		(−.63247)	(−1.45001)	(.865791)	(−1.925900)	(−3.83045)	(−1.51497)							
(7)	U0.370/U0	.05564	.03501	−.000037	−.000003	.00009	−.00232	−.070	.0083	.0124	1.24	1.790	.892	-------
		(.09691)	(.58420)	(−.127750)	(−.733983)	(.16253)	(−.39288)							
(8)	U0.400/U0	−2.04320	−.08153	.011100	−.000033	−.00039	−.01422	.526	.0064	.0323	.79	†11.897	5.042	-------
		(−4.62209)	(−1.74505)	(4.972170)	(−.895260)	(−.91991)	(−3.12427)							
(9)	U0.450/U0	−1.27339	.03224	.000638	−.000002	.00012	.00311	.860	.0024	.0070	1.04	4.914	†8.870	-------
		(−7.81174)	(1.89484)	(7.834953)	(−2.057270)	(.10551)	(1.85444)							
(10)	U0.500/U0	−4.83400	.15120	.002410	−.000013	.00059	.00038	.940	.0049	.0246	.98	*25.844	4.438	-------
		(−14.39260)	(4.31238)	(14.283900)	(−3.923770)	(1.85345)	(.02344)							
(11)	U0.550/U0	−6.68945	.15215	.003350	−.000011	.00146	.01536	.915	.0101	.0342	.66	*42.912	†6.088	-------
		(−9.61698)	(2.03533)	(9.619580)	(−2.434930)	(2.22113)	(2.22892)							
(12)	U0.600/U0	−12.63520	−.69334	.006880	.000005	−.00375	.02693	.971	.0137	.2018	1.06	2.428	2.480	-------
		(−13.41060)	(−7.05538)	(14.565600)	(.741580)	(−.83357)	(2.78255)							

(13)	U0.700/U0	4.46349	−.02061	−.002180	−.000056	.00046	.01862	.932	.0120	.0694	1.89	.764	.677	
		(5.39558)	(−.23870)	(−5.256280)	(−10.477700)	(.59067)	(2.18668)							
(14)	U0.750/U0	−.10549	−.00330	.000058	−.000000	.00008	.00331	.889	.0007	.0052	1.13	1.428	†6.124	
		(−2.32902)	(−.69882)	(2.555350)	(−1.733890)	(1.89328)	(7.10164)							
(15)	U0.800/U0	.55169	.04235	−.000292	−.000005	.00044	.00205	.278	.0031	.0123	1.97	.505	.162	
		(2.61397)	(1.92195)	(−2.761440)	(−3.820160)	(2.18306)	(.94262)							
(16)	U0.850/U0	−.17493	.02294	.000079	−.000000	−.00017	.02224	.974	.0015	.0060	1.13	2.770	*39.050	
		(−1.75267)	(2.20169)	(1.588410)	(−1.047140)	(−1.83500)	(21.64040)							
(17)	U0.900/U0	.90397	.04431	−.000414	−.000026	.00121	.01193	.793	.0093	.0943	2.31	.450	.856	
		(1.40739)	(.66079)	(−1.286790)	(−6.293310)	(1.99122)	(1.80392)							
(18)	U0.950/U0	1.30451	−.06129	−.000653	.000006	−.00022	−.01045	.688	.0054	−.0300	1.08	1.429	†7.273	
		(3.53276)	(−1.58995)	(−3.529520)	(2.591940)	(−.62499)	(−2.74769)							
(3′)	U0.250‡/U0	−1.47125	.06232	.000727	−.000002	−.00012	−.00470	−.079	.0049	.0145	-------	4.148	.471	.936
		(−1.07976)	(1.30053)	(1.056630)	(−.684610)	(−.38503)	(−.87293)							
(4′)	U0.270‡/U0	−.06918	−.02114	.000050	.000001	.00006	−.00003	−.006	.0013	.0059	-------	1.680	2.058	.966
		(−.16711)	(−1.68529)	(.237150)	(1.098890)	(.74616)	(−.01829)							
(5′)	U0.300‡/U0	.69955	−.04794	−.000321	.000001	−.00037	.00256	.165	.0022	.0197	-------	.286	.621	.955
		(1.04089)	(−2.21658)	(−.944490)	(.667110)	(−2.58758)	(1.05180)							
(8′)	U0.400‡/U0	−.73124	−.00294	.000391	−.000001	−.00015	−.00028	−.130	.0038	.0323	-------	1.885	.363	.891
		(−.81745)	(−0.7787)	(.869400)	(−.328660)	(−.61641)	(−.06608)							
(9′)	U0.450‡/U0	−1.29291	.03048	.000648	−.000002	.00004	.00323	.695	.0022	.0070	-------	2.101	4.505	.501
		(−5.21980)	(1.50510)	(5.268220)	(−1.53981)	(.31274)	(1.54186)							
(10′)	U0.500‡/U0	−4.55297	.05942	.002310	−.000004	.00018	−.00551	.522	.0036	.0246	-------	4.998	.677	.862
		(−5.89126)	(1.65795)	(5.945900)	(−1.718130)	(.79521)	(−1.38091)							
(11′)	U0.550‡/U0	−6.65574	.02777	.003400	−.000003	.00025	−.00284	.322	.0051	.0342	-------	5.447	.161	.963
		(−4.22658)	(.51785)	(4.271390)	(−.810970)	(.79057)	(−.51872)							
(14′)	U0.750‡/U0	−.04952	−.00489	.000030	.000000	.00002	−.00171	.195	.0001	.0052	-------	.856	1.171	.938
		(−.34620)	(−.97718)	(.418740)	(.667470)	(.68118)	(3.03659)							
(18′)	U0.950‡/U0	.98361	−.06996	−.000484	.000005	−.00012	−.01184	.385	.0048	−.0300	-------	.674	2.064	.529
		(1.73489)	(−.154651)	(−1.719320)	(1.744430)	(−.39534)	(−2.51781)							
1948–69: (16.1)	U0.850/U0	−.11557	−.00711	.000063	.000000	−.00001	.02787	NA	NA	NA	NA	----------		
		(−2.56081)	(−1.46210)	(2.762460)	(.719201)	(−.11852)	(26.57490)							
1970–78: (16.2)	U0.850/U0	2.40867	−.02327	−.001207	.000000	−.00106	.02787	NA	NA	NA	NA	----------		
		(4.74102)	(−.98910)	(−4.884000)	(.719201)	(−4.94788)	(26.57490)							

* Significant at 1 percent level.
† Significant at 5 percent level.

‡ Alternative estimate corrected for first-order serial correlation using generalized least squares.
NA—Not available.

TABLE I.A.2.b.—UNIFIED BUDGET OUTLAYS, PARTICULAR SUBFUNCTIONS, FISCAL YEARS 1962–78: BUDGET SHARES

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 51	$\Delta CPI_{t-1/2}$	DUM 73	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1969 F(4,8)	Autoregressive Parameter
(1)	0.1/UO	4.41072	0.27963	−0.002330		0.00228	−0.01515	0.942	0.0983	0.0047	1.11	*12.893	
		(4.04228)	(5.41632)	(−4.144210)		(2.73544)	(−3.29755)						
(2)	0.2/UO	−1.39226	−.00296	.000715		.00003	.00008	.969	.0007	.0148	.88	2.110	
		(−8.31315)	(−.37336)	(8.291120)		(.23954)	(1.11809)						
(3)	0.3/UO	18.24780	.42022	−.009350		.00284	−.03270	.919	.0183	.2386	.87	2.078	
		(4.32001)	(2.10260)	(−4.296110)		(.87859)	(−1.80379)						
(4)	0.4/UO	.38021	−.03922	−.000159		−.00087	−.00068	.445	.0028	.0255	.94	2.079	
		(.58614)	(−1.27799)	(−.474400)		(−1.78481)	(−.24823)						
(5)	0.5/UO	.20850	−.00937	−.000095		−.00016	.00078	.277	.0011	.0124	.77	3.161	
		(.84639)	(−.80387)	(−.745810)		(−.86953)	(.75589)						
(6)	0.6/UO	−2.54025	.12155	.001240		.00099	−.00742	.842	.0024	.0184	1.79	1.945	
		(−4.60863)	(4.66061)	(4.357700)		(2.33735)	(−3.19866)						
(7)	0.7/UO	−2.90155	−.01586	.001490		−.00072	−.00114	.897	.0019	.0106	1.81	1.911	
		(−6.55165)	(−.75697)	(6.520130)		(−2.11095)	(−.60961)						
(8)	0.8/UO	−11.89900	.09220	.006020		.00172	−.01012	.952	.0066	.0478	.92	*6.706	
		(−7.81723)	(1.28021)	(7.671070)		(1.47581)	(−1.57946)						
(9)	0.9/UO	−6.71727	−.10531	.003540		−.00158	.02802	.926	.0080	.1649	1.31	1.456	
		(−3.62282)	(−1.20039)	(3.703580)		(−1.11428)	(3.59052)						
(10)	0.10/UO	−1.25493	−.02823	.000659		−.00026	.00338	.917	.0014	.0159	2.23	2.112	
		(−3.86596)	(−1.83785)	(3.940150)		(−1.04643)	(2.47194)						
(11)	0.11/UO	1.55643	−.31206	−.000523		.00032	.00354	.798	.0048	.0269	1.93	1.798	
		(1.40070)	(−5.93545)	(−1.088070)		(.37897)	(.75735)						
(12)	0.12/UO	−3.45181	−.19223	.001870		−.00079	.00733	.948	.0034	.0388	1.28	.636	
		(−4.34693)	(−5.11635)	(4.564500)		(−1.30130)	(2.19167)						

(13)	0.13/UO	−1.10449	−.06826	.000635	−.00102	.00367	.379	.0044	.0768	1.74	1.562	
		(−1.08884)	(−1.42221)	(1.215080)	(−1.31593)	(.86058)						
(14)	Other/UO	7.45788	−.14010	−.003610	−.00278	.01906	.607	.0127	.2103	1.42	2.446	
		(2.54644)	(−1.01106)	(−2.389970)	(−1.24107)	(1.54582)						
(2′)	0.2†/UO	−1.43161	−.00253	.000735	−.00000	.00047	.907	.0006	.0148		.302	.627
		(−7.96747)	(−.26946)	(8.033220)	(−.01622)	(.66961)						
(3′)	0.3†/UO	18.59150	.43116	−.009530	.00264	−.02590	.800	.0152	.2386		.414	.586
		(4.24330)	(1.88556)	(−4.265340)	(.87836)	(−1.48972)						
(4′)	0.4†/UO	.35543	−.03315	−.000149	−.00074	−.00037	.109	.0024	.0255		.473	.556
		(.51462)	(−.92249)	(−.423980)	(−1.53898)	(−.13212)						
(5′)	0.5†/UO	.27820	−.01133	−.000129	−.00018	.00102	−.015	.0008	.0124		1.945	.634
		(1.11266)	(−.86677)	(−1.013970)	(−1.05906)	(1.04334)						
(8′)	0.8†/UO	−11.11900	.06145	.005640	.00089	−.00655	.835	.0055	.0478		3.077	.671
		(−6.71467)	(.71234)	(6.689580)	(.81908)	(−1.03310)						
1962–69: (1.1)	0.1/UO	3.37803	.11961	−.001725	.00262	−.00727	NA	NA	NA	NA		
		(1.05307)	(1.02080)	(−1.022930)	(1.39299)	(−1.77680)						
1970–78: (1.2)	0.1/UO	9.66281	.20054	−.004950	.00102	−.00727	NA	NA	NA	NA		
		(4.87132)	(2.18284)	(−5.131918)	(1.21412)	(−1.77680)						

*Significant at 5 percent level.
†Alternative estimate corrected for first-order serial correlation using generalized least squares.

NA—Not available.

TABLE I.A.2.c.—UNIFIED BUDGET OUTLAYS, CONTROLLABLE-UNCONTROLLABLE CATEGORIZATION, FISCAL YEARS 1948–68, BUDGET SHARES

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 51	$\Delta CPI_{t-1/2}$	DUM 73	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,21)	Chow Test Statistic: Break Following 1969 F(4,21)	Auto-regressive Parameter
(1)	U.1/U0	−11.97940	−0.24337	0.006280	0.000009	−0.00100	0.00035	0.960	0.0127	0.1276	0.86	*9.406	*6.623	-------
		(−13.70960)	(−2.66798)	(14.342400)	(1.518800)	(−1.20452)	(.00565)							
(2)	U.2/U0	−1.89751	−.00230	.000980	−.000002	−.00018	.00705	.978	.0016	.0232	1.88	2.405	2.714	-------
		(−17.03110)	(−.19742)	(17.548500)	(−2.525650)	(1.67174)	(6.14462)							
(3)	U.3/U0	1.08175	−.34850	−.000360	−.000001	−.00042	.00260	.861	.0040	.0304	1.97	1.156	2.393	-------
		(3.91084)	(−12.06920)	(−2.598210)	(−.559050)	(−1.59244)	(.91210)							
(4)	U.4/U0	3.61684	−.01178	−.001760	−.000051	.0009	.01590	.928	.0108	.0544	1.80	.939	.910	-------
		(4.84145)	(−.15106)	(−4.710620)	(−10.564100)	(.12861)	(2.06774)							
(5)	U.5/U0	−5.39097	.13223	.002700	−.000009	.00142	.01641	.884	.0102	.0228	.61	†64.741	*6.063	-------
		(−7.69531)	(1.80804)	(−7.674800)	(−1.940070)	(2.14174)	(2.27487)							
(6)	U.6‡/U0	−.25114	−.00602	.000132	−.000000	.00000	.00330	.957	.0005	.0025	1.02	*6.667	*13.293	-------
		(−7.17747)	(−1.68443)	(7.518000)	(−.086090)	(.06093)	(9.14771)							
(7)	U.7/U0	−.51550	−.10049	.000326	−.000001	.00032	.01647	.878	.0040	.0279	1.40	*13.166	*14.498	-------
		(−1.85687)	(−3.46737)	(2.340460)	(−.652530)	(1.22862)	(5.76161)							
(1′)	U.1‡/U0	−10.21840	−.02892	.005280	.000007	−.00035	.02039	.708	.0085	.1276	-------	.828	.261	.865
		(−5.61153)	(−.34523)	(5.770350)	(1.314460)	(−.64053)	(2.18503)							
(5′)	U.5‡/U0	−6.04367	.02750	.003080	−.000003	.00030	−.00426	.276	.0049	.0228	-------	*6.783	.239	.962
		(−3.94665)	(.58304)	(3.982940)	(−.926480)	(.97563)	(−.79930)							
(6′)	U.6‡/U0	−.42378	.00322	.000217	−.000000	−.00001	.00147	.574	.0004	.0025	-------	3.496	*6.129	.953
		(−3.95470)	(.06182)	(4.014350)	(−.540140)	(−.53160)	(3.74624)							
1948–65: (5′.1)	U.5/U0	−.32776	.00525	.000166	−.000000	.00001	−.01319	NA	NA	NA	NA	-------		
		(−3.10828)	(1.59428)	(3.085040)	(−1.579240)	(.46156)	(−1.84211)							
1966–78: (5′ .2)	U.5/U0	−15.12290	.20375	.007590	−.000000	.00155	−.01319	NA	NA	NA	NA	-------		
		(−4.36353)	(1.64419)	(4.378750)	(−1.579240)	(1.33896)	(−1.84211)							
1948–69: (6′ .1)	U.6/U0	−.16328	−.00130	.000085	−.000000	−.00000	.00089	NA	NA	NA	NA	-------		
		(−3.21927)	(−.71694)	(3.268560)	(−.037240)	(−.40218)	(1.13479)	NA	NA	NA	NA	-------		
1970–78: (6′ .2)	U.6/U0	−1.17685	.00175	.000596	−.000000	−.00006	.00089	NA	NA	NA	NA	-------		
		(−2.52250)	(.29162)	(2.576910)	(−.037240)	(−.41957)	(1.13478)							
1948–69: (7.1)	U.7/U0	.05074	−.03358	.000003	−.000002	−.00020	.01185	NA	NA	NA	NA	-------		
		(.26988)	(−1.65650)	(.042429)	(−1.841230)	(−1.12233)	(2.71309)							
1970–78: (7.2)	U.7/U0	.54028	−.32025	−.000093	−.000002	−.00139	.01185	NA	NA	NA	NA	-------		
		(.25526)	(−3.26680)	(−.090682)	(−1.841230)	(−1.54731)	(2.71309)							

* Significant at 5 percent level.
† Significant at 1 percent level.
‡ Alternative estimate corrected for first-order serial correlation using generalized least squares.

NA.—Not available.

TABLE I.B.1.—NIA BUDGET EXPENDITURES, CALENDAR YEARS 1947–78: RATIOS TO POTENTIAL GNP

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 51	$\Delta CPI_{t-1/2}$	DUM 72	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,22)	Chow Test Statistic: Break Following 1969 F(4,22)	Auto-regressive Parameter
(1)	E/Pot. GNP	−1.74581	0.13321	0.000899	0.000021	0.00034	0.00794	0.769	0.0115	0.1875	1.21	1.894	0.781	
		(−2.119266)	(1.68519)	(2.165460)	(4.515210)	(.47320)	(.98170)							
(2)	E. Def/Pot. GNP	4.19147	.15358	−.002204	.000037	−.00022	−.00403	.880	.0089	.0769	1.40	1.810	.472	
		(6.56285)	(2.50593)	(−6.849880)	(10.292400)	(−.39078)	(−.64282)							
(3)	E. Nondef/Pot. GNP	−.93348	.02802	.000476	−.000003	−.00003	−.00222	.366	.0033	.0211	1.40	.414	.284	
		(−4.00282)	(1.25229)	(4.047060)	(−2.487730)	(−.12917)	(−.96882)							
(4)	E. DomTr/Pot. GNP	−3.16832	−.07370	.001678	−.000005	.00048	.00994	.978	.0028	.0492	1.71	2.887	2.154	
		(−15.53520)	(−3.76583)	(16.332300)	(−4.265610)	(2.65623)	(4.96195)							
(5)	E. ForTr/Pot. GNP	.40706	.00076	−.000202	−.000004	−.00009	.00122	.811	.0017	.0047	1.91	.335	.232	
		(3.30326	(.06447)	(−3.255100)	(−5.370770)	(−.81032)	(1.00721)							
(6)	E. Grants/Pot. GNP	−1.81178	.01730	.000925	−.000002	.00020	.00484	.985	.0012	.0175	1.20	4.235	5.170	
		(−21.38560)	(2.12780)	(21.657100)	(−4.805290)	(2.69151)	(5.81305)							
(7)	E. NetInt/Pot. GNP	−.07844	.00940	.000043	−.000001	.00016	.00078	.753	.0007	.0133	1.44	*6.325	5.277	
		(−1.47484)	(1.84159)	(1.610100)	(−5.819250)	(3.47830)	(1.48439)							
(8)	E. Other/Pot. GNP	−.35231	−.00215	.000184	−.000000	−.00016	−.00258	.532	.0012	.0048	1.12	*7.386	4.593	
		(−4.20544)	(−.26732)	(4.352840)	(−.302050)	(−2.21274)	(−3.13136)							
1947–65: (7.1)	E. NetInt/Pot. GNP	.02901	.01267	−.000013	−.000002	.00011	−.00185	NA	NA	NA	NA			
		(.35210)	(2.09562)	(−.331507)	(−5.957360)	(2.59283)	(−2.82395)							
1966–78: (7.2)	E. NetInt/Pot. GNP	−1.14066	.03496	.000569	−.000002	.00028	−.00185	NA	NA	NA	NA			
		(−4.49961)	(2.58366)	(4.590600)	(−5.957360)	(2.03682)	(−2.82395)							
1947–65: (8.1)	E. Other/Pot. GNP	−.65478	−.00879	.000342	−.000000	.00000	.00058	NA	NA	NA				
		(−5.26595)	(−.96340)	(5.579490)	(−1.036530)	(.01331)	(.59169)							
1966–78: (8.2)	E. Other/Pot. GNP	.45855	−.00159	−.000228	−.000000	−.00022	.00058	NA	NA	NA				
		(1.19874)	(−.07768)	(−1.219280)	(−1.036530)	(−1.05162)	(.59169)							

*Significant at 5 percent level.

NA—Not available.

TABLE I.B.2.a.—UNIFIED BUDGET FUNCTIONAL OUTLAYS, FISCAL YEARS 1948–78: RATIOS TO POTENTIAL GNP

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 51	$\Delta CPI_{t-1/2}$	DUM 73	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,21)	Chow Test Statistic: Break Following 1969 F(4,21)	Auto-regressive Parameter
(1)	U0/Pot.GNP	−2.66870	0.16393	0.001358	0.000016	0.00028	−0.00086	0.640	0.0138	0.1878	1.75	0.511	0.586	
		(−2.79600)	(1.64500)	(2.838000)	(2.653000)	(.30480)	(−.08760)							
(2)	U0.050/Pot.GNP	3.42256	.17012	−.001821	.000037	.00357	−.00931	.746	.0132	.0795	1.85	.182	.113	
		(3.76254)	(1.79149)	(−3.993100)	(6.256350)	(.41360)	(−.99452)							
(3)	U0.150/Pot.GNP	.23665	.00283	−.000113	−.000006	.00002	−.00168	.833	.0018	.0074	1.53	1.446	1.055	
		(1.85901)	(.21302)	(−1.772250)	(−6.725540)	(.15123)	(−1.28323)							
(4)	U0.250/Pot.GNP	−.82215	.03319	.000406	−.000002	−.00012	−.00467	.614	.0018	.0028	.48	*16.520	4.508	
		(−6.61637)	(2.55846)	(6.516000)	(−2.088310)	(−1.02780)	(−3.64721)							
(5)	U0.270/Pot.GNP	−.00739	−.00123	.000005	−.000000	.00003	.00041	.220	.0004	.0011	.56	3.733	†10.074	
		(−.27015)	(−.43192)	(.359120)	(−.426710)	(.95885)	(1.44204)							
(6)	U0.300/Pot.GNP	−.05977	−.00029	.000032	−.000001	−.00002	.00083	.410	.0006	.0037	.65	1.144	1.412	
		(−1.55904)	(−.07286)	(1.711690)	(−2.156190)	(−.57815)	(2.09962)							
(7)	U0.350/Pot.GNP	−.13974	−.01562	.000084	−.000001	−.00047	−.00254	.399	.0020	.0048	1.75	.805	.128	
		(−1.00122)	(−1.07221)	(1.195130)	(−1.308110)	(−3.55115)	(−1.76455)							
(8)	U0.370/Pot.GNP	−.03318	.00901	.000014	−.000000	.00004	−.00065	−.126	.0016	.0023	1.32	1.986	1.060	
		(−.30607)	(.79582)	(.253150)	(−.319790)	(.42595)	(−.58391)							
(9)	U0.400/Pot.GNP	−.48249	−.01004	.000254	−.000000	−.00007	−.00269	.727	.0010	.0061	.78	†9.622	5.254	
		(−6.67321)	(−1.33007)	(7.020170)	(−.369690)	(−1.01775)	(−3.61617)							
(10)	U0.450/Pot.GNP	−.26245	.00665	.000131	−.000000	.00000	.00066	.870	.0005	.0014	.99	†6.276	†11.121	
		(−8.08786)	(1.96367)	(8.077320)	(−2.090220)	(.12842)	(1.98954)							
(11)	U0.500/Pot.GNP	−1.00654	.03187	.000501	−.000002	.00013	.00001	.930	.0011	.0049	.97	*22.944	3.770	
		(−13.15700)	(3.99103)	(13.051900)	(−3.353590)	(1.83698)	(.01191)							
(12)	U0.550/Pot.GNP	−1.38818	.03132	.000696	−.000002	.00133	.00001	.909	.0022	.0069	.65	*37.846	5.211	
		(−9.27093)	(2.00354)	(9.271960)	(−3.353590)	(1.83698)	(.01191)							
(13)	U0.600/Pot. GNP	−2.93769	−.11051	.001569	.000002	.00001	.00503	.991	.0017	.0389	1.53	1.355	2.420	
		(−24.66090)	(−8.88671)	(26.271600)	(2.581100)	(.11399)	(4.91760)							
(14)	U0.700/Pot. GNP	.61919	.00047	−.000304	−.000007	−.00007	.00366	.906	.0017	.0122	1.15	3.890	3.006	
		(5.29261)	(.03852)	(−5.178010)	(−8.695620)	(−.64212)	(3.03648)							

(15)	U0.750/Pot. GNP	−.03406	−.00032	.000018	−.000000	.00002	.00067	.926	.0001	.0010	.88	4.333	†13.938		
		(−4.13214)	(−.37273)	(4.339000)	(−.190200)	(1.88376)	(7.90067)								
(16)	U0.800/Pot. GNP	.06187	.00913	−.000035	−.000001	.00005	.00043	.592	.0004	.0022	1.60	1.142	.505		
		(2.04538)	(2.89160)	(−2.283490)	(−2.540300)	(1.70434)	(1.37804)								
(17)	U0.850/Pot. GNP	−.03880	.00416	.000018	−.000000	−.00003	.00449	.980	.0003	.0012	1.38	2.373	*33.486		
		(−2.19451)	(2.25477)	(2.033020)	(−1.005320)	(−1.81053)	(24.66080)								
(18)	U0.900/Pot. GNP	−.13319	.01837	.000069	−.000002	.00012	.00242	.725	.0010	.0174	1.07	†14.310	†11.106		
		(−1.86322)	(2.46200)	(1.929410)	(−4.991670)	(1.78926)	(3.28795)								
(19)	U0.950/Pot. GNP	.33871	−.01539	−.000168	.000001	−.00004	−.00209	.806	.0009	−.0057	.91	1.917	†7.956		
		(5.22461)	(−2.27370)	(−5.172920)	(1.686930)	(−.56322)	(−3.12752)								
(4′)	U0.250‡/Pot. GNP	−.31073	.01332	.000153	−.000470	−.00002	−.00100	−.044	.0009	.0028	-------	4.421	.694	.945	
		(−1.24425)	(1.57948)	(1.215320)	(−.856720)	(−.27271)	(−1.05553)								
(5′)	U0.270‡/Pot. GNP	−.08674	−.00296	.000046	.000072	.00002	−.00009	.016	.0003	.0011	-------	1.280	1.790	.936	
		(−1.21287)	(−1.17644)	(1.283570)	(.440650)	(.96304)	(−.30140)								
(6′)	U0.300‡/Pot. GNP	−.07163	−.00501	.000041	−.000108	−.00004	.00030	.127	.0004	.0037	-------	.659	1.092	.836	
		(−.97319)	(−1.36313)	(1.112570)	(−.461410)	(−1.59502)	(.74163)								
(9′)	U0.400‡/Pot. GNP	−.33147	.00271	.000171	−.000304	−.00002	−.00037	.028	.0006	.0061	-------	2.283	.704	.895	
		(−2.17344)	(.42641)	(2.225860)	(−.744240)	(−.48340)	(−.52188)								
(10′)	U0.450‡/Pot. GNP	−.27348	.00588	.000137	−.000373	.00001	.00063	.686	.0004	.0014	-------	2.264	4.552	.552	
		(−5.24370)	(1.44265)	(5.301880)	(−1.497220)	(.27688)	(1.48902)								
(11′)	U0.500‡/Pot. GNP	−.98227	.01157	.000498	−.000844	.00005	−.00121	.559	.0008	.0049	-------	3.553	.584	.825	
		(−6.09182)	(1.39629)	(6.167090)	(−1.605320)	(.94357)	(−.131996)								
(12′)	U0.550‡/Pot. GNP	−1.43398	.00408	.000733	−.000568	.00007	−.00076	.336	.0011	.0069	-------	3.824	.240	.952	
		(−4.27815)	(.37260)	(4.329940)	(−.796850)	(.97091)	(−.61583)								
(15′)	U0.750‡/Pot. GNP	−.05237	−.00066	.000027	.000003	.00001	.00029	.498	.0001	.0010	-------	1.623	1.929	.918	
		(−2.75202)	(−.91445)	(2.865840)	(.062840)	(1.49393)	(3.57575)								
(19′)	U0.950‡/Pot. GNP	.30673	−.01458	−.000152	.000688	−.00001	−.00213	.538	.0008	−.0057	-------	.724	2.175	.585	
		(2.99412)	(−1.88410)	(−2.990650)	(1.447640)	(−.09265)	(−2.61553)								
1948–69: (17.1)	U0.850/Pot. GNP	−.02735	−.00087	.000015	.000000	−.00000	.00559	NA	NA	NA	NA	----------			
		(−3.19921)	(−.93963)	(3.347830)	(.726684)	(−.11750)	(28.15850)								
1970–78: (17.2)	U0.850/Pot. GNP	.48370	−.00868	−.000240	.000000	−.00023	.00559	NA	NA	NA	NA	----------			
		(5.02569)	(−1.94637)	(−5.133810)	(.726684)	(−5.67804)	(28.15850)								
1948–65: (18.1)	U0.900/Pot GNP	.12440	.02618	−.000066	−.000002	−.00005	−.00080	NA	NA	NA	NA	----------			
		(1.24325)	(3.23999)	(−1.364460)	(−6.276950)	(−1.02833)	(−1.12695)								
1966–78: (18.2)	U0.900/Pot. GNP	−.99628	.03456	.000499	−.000002	.00040	−.00080	NA	NA	NA	NA	----------			
		(−3.65923)	(2.41677)	(3.749490)	(−6.276950)	(2.86941)	(−1.12695)								

* Significant at 1 percent level.
† Significant at 5 percent level.

‡ Alternative estimate corrected for first-order serial correlation using generalized least squares.
NA—Not available.

TABLE I.B.2.b.—UNIFIED BUDGET OUTLAYS, PARTICULAR SUBFUNCTIONS, FISCAL YEARS 1962–78, RATIOS TO POTENTIAL GNP

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	$\Delta CPI_{t-1/2}$	DUM 73	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1969 F(4,8)	Autoregressive Parameter
(1)	0.1/Pot. GNP	0.55030	0.07303	−0.000306	0.00056	−0.00405	0.923	0.0010	0.0196	1.49	3.477	
		(2.28277)	(6.39972)	(−2.466290)	(3.58129)	(−3.98989)						
(2)	0.2/Pot. GNP	−.31931	.00001	.000164	.00002	.00004	.993	.0001	.0030	1.04	3.587	
		(−18.75580)	(.00337)	(18.641900)	(1.74315)	(.55457)						
(3)	0.3/Pot. GNP	2.75584	.13362	−.001442	.00109	−.00302	.802	.0055	.0474	.99	1.625	
		(2.15476)	(2.20318)	(−2.187320)	(1.10397)	(−1.67469)						
(4)	0.4/Pot. GNP	−.01552	−.00425	.000013	−.00013	−.00038	.264	.0005	.0051	.93	3.092	
		(−.13870)	(−.80252)	(.223770)	(−1.46653)	(−.80119)						
(5)	0.5/Pot. GNP	−.00114	−.00030	.000002	−.00001	.00004	−.306	.0002	.0025	.64	4.382	
		(−.03025)	(−.16702)	(.103180)	(−.39052)	(.23318)						
(6)	0.6/Pot. GNP	−.55059	.02566	.000269	.00022	−.00164	.821	.0006	.0037	1.74	1.150	
		(−4.29009)	(4.22419)	(4.059580)	(2.23172)	(−3.03361)						
(7)	0.7/Pot. GNP	−.61101	−.00345	.000313	−.00014	−.00030	.881	.0004	.0022	1.69	1.903	
		(−6.06767)	(−.72496)	(6.038610)	(−1.82898)	(−.71246)						
(8)	0.8/Pot. GNP	−2.48195	.01728	.001256	.00036	−.00236	.948	.0014	.0098	1.00	4.393	
		(−7.56230)	(1.11270)	(7.426260)	(1.43644)	(−1.70453)						
(9)	0.9/Pot. GNP	−1.85622	−.00964	.000963	−.00010	.00119	.984	.0008	.0330	1.75	2.169	
		(−9.48066)	(−1.04058)	(9.547940)	(−.67114)	(5.08926)						
(10)	0.10/Pot. GNP	−.29838	−.00504	.000156	−.00004	.00055	.910	.0003	.0032	2.13	.983	
		(−4.03424)	(−1.43944)	(4.081820)	(−.63143)	(1.76682)						
(11)	0.11/Pot. GNP	.22678	−.06030	−.000083	.00012	.00052	.781	.0010	.0054	1.94	1.981	
		(.94400)	(−5.30467)	(−.669150)	(.62316)	(.51147)						
(12)	0.12/Pot. GNP	−.80493	−.03784	.000431	−.00012	.00117	.968	.0006	.0078	1.50	.439	
		(−6.03393)	(−5.99478)	(6.275600)	(−1.17025)	(2.09109)						
(13)	0.13/Pot. GNP	−.48252	−.00552	.000255	−.00009	.00002	.771	.0006	.0153	1.36	2.735	
		(−3.31333)	(−.80052)	(3.406740)	(−.77496)	(.03987)						
(14)	Other/Pot. GNP	.75770	.00115	−.000364	−.00016	.00181	.183	.0024	.0419	1.95	1.605	
		(1.39107)	(.04460)	(−1.296580)	(−.39193)	(.78798)						
(2′)	0.2*/Pot. GNP	−.31710	−.00057	.000163	.00001	.00002	.965	.0662	.0030	-------	1.028	.734
		(−15.10720)	(−.52869)	(15.252400)	(.78944)	(.30967)						
(3′)	0.3*/Pot. GNP	2.90690	.12123	−.001512	.00090	−.00738	.596	.0048	.0474	-------	.355	.524
		(2.15709)	(1.73727)	(−2.196650)	(.94696)	(−1.35632)						
(4′)	0.4*/Pot. GNP	−.00737	−.00390	.000009	−.00011	−.00024	−.026	.0004	.0051	-------	.772	.566
		(−.06216)	(−.63228)	(.140860)	(−1.34909)	(−.51049)						
(5′)	0.5*/Pot. GNP	.02755	−.00181	−.000012	−.00302	.00015	−.104	.0001	.0025	-------	.506	.786
		(.71618)	(−.94856)	(−.605110)	(−1.04934)	(1.13055)						
(8′)	0.8*/Pot. GNP	−2.33154	.01007	.001183	.00020	−.00156	.844	.0012	.0098	-------	2.051	.617
		(−6.53246)	(.53968)	(6.506540)	(.83353)	(−1.11031)						

*Alternative estimate corrected for first-order serial correlation using generalized least squares.

TABLE I.B.2.c.—UNIFIED BUDGET, CONTROLLABLE-UNCONTROLLABLE CATEGORIZATION, FISCAL YEARS 1948–78 RATIOS TO POTENTIAL GNP

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 51	$\Delta CPI_{t-1/2}$	DUM 73	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,21)	Chow Test Statistic: Break Following 1969 F(4,21)	Auto-regressive Parameter
(1)	U.1/Pot. GNP	−2.62941	−0.02933	0.001366	0.000001	−0.00007	0.00046	0.986	0.0016	0.0248	0.91	*12.261	*10.037	
		(−24.50010)	(−2.61759)	(25.380200)	(1.960930)	(−.68508)	(.41197)							
(2)	U.2/Pot. GNP	−.42705	.00162	.000219	−.000211	.00005	.00146	.985	.0003	.0045	1.15	†40.798	†35.909	
		(−20.89060)	(.75939)	(21.367400)	(−1.587560)	(2.33811)	(6.91468)							
(3)	U.3/Pot. GNP	.13879	−.06377	−.000037	.000638	−.00005	.00060	.796	.0009	.0056	1.88	1.245	2.649	
		(2.22710)	(−9.81079)	(−1.170240)	(1.576600)	(−.87762)	(.93233)							
(4)	U.4/Pot. GNP	.50957	.00094	−.000250	−.000006	−.00011	.00308	.892	.0016	.0095	1.18	3.472	2.990	
		(4.49505)	(.07933)	(−4.393460)	(−8.450690)	(−98242)	(2.64178)							
(5)	U.5/Pot. GNP	−1.10665	.02608	.000554	−.000002	.00030	.00326	.879	.0021	.0047	.62	†52.853	5.442	
		(−7.54072)	(1.70236)	(7.527470)	(−1.876260)	(2.14124)	(2.15565)							
(6)	U.6/Pot. GNP	−.05276	−.00114	.000028	−.000009	.00000	.00067	958	.0001	.0005	1.02	*11.814	†18.758	
		(−7.39766)	(−1.53631)	(7.728240)	(−.193660)	(.42616)	(9.17964)							
(7)	U.7/Pot. GNP	−.16836	−.01812	.000097	.000227	.00008	.00332	.894	.0009	.0053	1.15	†34.182	†37.296	
		(−2.90254)	(−2.99309)	(3.329840)	(.603740)	(1.37139)	(5.56670)							
(1′)	U.1‡/Pot. GNP	−2.43350	−.00005	.001251	.000546	.00002	.00336	.849	.0010	.0248	.....	2.744	1.290	.902
		(−9.65620)	(−.00458)	(9.861620	(.828570)	(.28816)	(2.93325)							
(5′)	U.5‡/Pot. GNP	−1.24592	.00314	.000637	−.000522	.00007	−.00096	.264	.0011	.0047	.....	5.285	.281	.960
		(−3.80813)	(.30625)	(3.851020)	(−.779600)	(.99560)	(−.83322)							
(6′)	U.6‡/Pot. GNP	−.09048	−.00011	.000046	−.000022	−.00000	.00028	.565	.0001	.0005	.....	4.110	*6.505	.967
		(−4.06031)	(−.15864)	(4.123750)	(−.499510)	(−.27800)	(3.68893)							
1948–65: (2.1)	U.2/Pot. GNP	−.35735	.00544	.000181	−.000000	.00000	.00081	NA	NA	NA	NA			
		(−19.16210)	(3.61006)	(20.051500)	(−3.184080)	(.15627)	(6.13901)							
1966–78: (2.2)	U2/Pot. GNP	−.49524	−.01041	.000260	−.000000	−.00004	.00081	NA	NA	NA	NA			
		(−9.75997)	(−3.90660)	(10.484100)	(−3.184080)	(−1.47033)	(6.13901)							
1948–69: (6′.1)	U6/Pot.GNP	−.03581	−.00010	.000018	−.000007	−.00025	.00019	NA	NA	NA	NA			
		(−5.63654)	(−.48772)	(5.691130)	(−.653340)	(−.21538)	(1.17917)							
1970–78: (6′.2)	U6/Pot.GNP	−.23507	−.00003	.000120	−.000007	−.00002	.00019	NA	NA	NA	NA			
		(−2.42312)	(−.00948)	(2.484390)	(−.653340)	(−.50809)	(1.17917)							
1948–69: (7.1)	U7/Pot.GNP	−.05515	−.00135	.000031	−.000000	−.00005	.00236	NA	NA	NA	NA			
		(−2.05997)	(−.46651)	(2.274650)	(−.146873)	(−1.92825)	(3.79384)							
1970–78: (7.2)	U7/Pot.GNP	.09549	−.07231	−.000008	−.000000	−.00031	.00236	NA	NA	NA	NA			
		(.31686)	(−5.18036)	(−.057724)	(−.146873)	(−2.41922)	(3.79384)							

*Significant at 5 percent level.
†Significant at 1 percent level.

‡Alternative estimate corrected for first-order serial correlation using generalized least squares.
NA—Not available.

TABLE II.A.1.—NIA BUDGET RECEIPTS, CALENDAR YEARS 1947–78: BUDGET SHARES

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 64	$\Delta CPI_{t-1/2}$	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,22)	Chow Test Statistic: Break Following 1969 F(4,22)	Autoregressive Parameter
(1)	T.Pers/T	−4.36950	0.18610	0.002367	−0.000016	0.00102	0.091	0.0214	0.4466	1.23	0.984	1.802	.....
		(−2.13776)	(1.16481)	(2.372390)	(−1.738390)	(.84538)							
(2)	T.Corp/T	7.21673	.39440	−.003754	−.000008	−.00108	.824	.0217	.2235	1.22	2.489	3.327	.....
		(3.48693)	(2.43797)	(−3.716480)	(−.798830)	(−.88305)							
(3)	T.IndBus/T	10.23380	−.28292	−.005011	.000013	−.00185	.973	.0061	.1266	.99	3.300	2.874	.....
		(17.60550)	(−6.22694)	(−17.662700)	(4.787400)	(−5.39727)							
(4)	T.ScocIns/T	−12.08100	−.29757	.006399	.00011	.00191	.980	.0107	.2033	1.46	2.071	1.201	.....
		(−11.81480)	(−3.72310)	(12.820900)	(2.370270)	(3.16569)							
(3′)	T.IndBus*/T	9.69774	−.24893	−.004750	.000010	−.00180	.926	.0052	.1266	.....	1.026	.517	584
		(14.88240)	(−5.83415)	(−14.560500)	(3.422140)	(−5.51725)							

*Alternative estimate corrected for first-order serial correlation using generalized least squares.

TABLE II.A.2.—UNIFIED BUDGET RECEIPTS, FISCAL YEARS 1948–78: BUDGET SHARES

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 64	$\Delta CPI_{t-1/2}$	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,21)	Chow Test Statistic: Break Following 1969 F(4,21)	Autoregressive Parameter
(1)	UR. Pers/UR	−5.07269	0.21652	0.002710	−0.000019	0.00161	0.289	0.0155	0.4380	1.40	0.391	0.927	
		(−3.20998)	(1.74171)	(3.514660)	(−2.709580)	(1.79504)							
(2)	UR. Corp/UR	7.84553	.41646	−.004090	−.000009	−.00154	.864	.0202	.2178	1.30	.258	1.019	
		(3.82235)	(2.59007)	(−4.086810)	(−.971980)	(−1.31619)							
(3)	UR. SocIns/R	−12.88710	−.23855	.006770	.000008	.00144	.979	.0105	.1887	1.15	.872	.969	
		(−12.04320)	(−2.84571)	(12.994000)	(1.688980)	(2.36012)							
(4)	UR. Ex/UR	11.66860	−.31741	−.005730	.000014	−.00152	.973	.0066	.1134	1.50	.549	.312	
		(17.30540)	(−6.00919)	(−17.450500)	(4.640420)	(−3.95972)							
(5)	UR. E&G/UR	.49773	−.03982	−.000226	.000004	−.00020	.198	.0030	.0183	.93	5.526	5.193	
		(1.62993)	(−1.66477)	(−1.517060)	(2.618140)	(−1.12121)							
(6)	UR. Cust/UR	−.22486	−.00997	.000125	.000001	−.00004	.723	.0012	.0116	1.44	1.258	.749	
		(−1.91174)	(−1.08165)	(2.183750)	(1.546240)	(−.53546)							
(7)	UR. FRS/UR	−.78474	−.01418	.000411	.000001	.00014	.901	.0018	.0104	1.50	2.378	2.538	
		(−4.39561)	(−1.01358)	(4.727320)	(1.874530)	(1.40861)							
(8)	UR. Other/UR	−.04243	−.01216	.000028	.000000	.00009	.197	.0012	.0018	2.11	.979	1.609	
		(−.34788)	(−1.27237)	(.477730)	(.203170)	(1.33697)							
(5′)	UR. E&G*/UR	.34213	−.01778	−.000157	.000001	−.00012	−.080	.0025	.0183		5.526	5.193	.724
		(.90715)	(.81600)	(−.824830)	(.981800)	(−.76368)							

* Alternative estimate corrected for first-order serial correlation using generalized least squares.

TABLE II.B.1.—NIA BUDGET RECEIPTS, CALENDAR YEARS 1947–78: RATIOS TO POTENTIAL GNP

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 64	$\Delta CPI_{t-1/3}$	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,22)	Chow Test Statistic: Break Following 1969 F(4,22)	Autoregressive Parameter
(1)	T/Pot. GNP	−4.22349	0.47656	0.002011	−0.000012	0.00150	0.891	0.0045	0.1841	1.59	0.256	0.956	----
		(−9.79996)	(14.14700)	(9.560010)	(−6.247720)	(5.89413)							
(2)	T. Pers/Pot. GNP	−2.68941	.24266	.001294	−.000008	.00082	.669	.0049	.0823	1.37	.621	1.484	----
		(−5.80343)	(6.69911)	(5.718480)	(−3.821060)	(2.99901)							
(3)	T. Corp/Pot. GNP	.26352	.18543	−.000204	−.000005	.00017	.793	.0043	.0410	1.15	3.064	3.764	----
		(.64213)	(5.78068)	(−1.018730)	(−2.438420)	(.71630)							
(4)	T. IndBus/Pot. GNP	1.15062	.02008	−.000584	.000000	−.00011	.953	.0013	.0230	.94	*6.037	2.783	----
		(9.54490)	(2.13080)	(−9.932360)	(.178030)	(−1.51488)							
(5)	T. SocIns/Pot. GNP	−2.94822	.02839	.001506	.000000	.00061	.979	.0022	.0378	1.53	*7.308	2.148	----
		(−14.11720)	(1.73943)	(14.774200)	(.274910)	(4.97536)							
(4′)	T. IndBust/Pot. GNP	1.20568	.01984	−.000613	.000000	−.00005	.874	.0011	.0230	----	2.164	.689	.566
		(9.01982)	(2.23920)	(−9.154510)	(.366100)	(−.73500)							
1947–65: (5.1)	T. SocIns/Pot. GNP	−2.46754	−.01144	.001279	−.000000	.00041	NA	NA	NA	NA	----	----	----
		(−12.78210)	(−.73735)	(13.368700)	(−.195678)	(3.44218)							
1966–78: (5.2)	T. SocIns/Pot. GNP	−3.67236	.10049	.001837	−.000000	.00090	NA	NA	NA	NA	----	----	----
		(−8.09042)	(4.15232)	(8.284870)	(−.195678)	(3.41912)							

*Significant at the 5 percent level.
†Alternative estimate corrected for first-order serial correlation using generalized least squares.
NA—Not available.

TABLE II.B.2.—UNIFIED BUDGET RECEIPTS, FISCAL YEARS 1948–78: RATIOS TO POTENTIAL GNP

Equ. No.	Dependent/Variable	Intercept	Actual GNP/ Pot. GNP	Time	Time·DUM 64	$\Delta CPI_{t-1/2}$	$\bar{R}^2$	S.E.E.	$\bar{Y}$	D.W.	Chow Test Statistic: Break Following 1965 F(4,22)	Chow Test Statistic: Break Following 1969 F(4,22)	Autoregressive Parameter
(1)	UR/Pot. GNP	−4.45586	0.48664	0.002123	−0.000011	0.00087	0.724	0.0078	0.1788	2.04	0.948	0.578	
		(−5.62762)	(7.84562)	(5.503250)	(−3.265710)	(1.93253)							
(2)	UR. Pers/Pot. GNP	−2.82960	.24454	.001362	−.000008	.00064	.684	.0046	.0789	1.49	.499	.342	
		(−6.08583)	(6.71391)	(6.014590)	(−3.871920)	(2.42840)							
(3)	UR. Corp./Pot. GNP	(.22551	.19685	−.000191	−.000005	−.00003	.753	.0051	.0390	1.50	.501	.794	
		(.43735	(4.87329)	(−.749540)	(−2.131180)	(−.09467)							
(4)	UR. SocIns/Pot. GNP	−2.92759	.02956	.001493	.000000	.00039	.982	.0019	.0342	1.53	3.335	1.545	
		(−15.24980)	(1.96564)	(15.967000)	(.332360)	(3.52470)							
(5)	UR. Ex/Pot. GNP	1.34441	.01111	−.000680	.000000	−.00016	.965	.0012	.0201	1.03	3.782	.683	
		(11.40540)	(1.20372)	(−11.844800)	(.768440)	(−2.33498)							
(6)	UR. E&G/Pto. GNP	.00579	.00128	−.000002	.000000	−.00003	.323	.0005	.0033	.99	4.181	5.697	
		(.10729)	(.30385)	(−.079070)	(1.869500)	(−.80618)							
(7)	UR. Cust./Pot. GNP	−.08828	.00329	.000044	.000000	.00000	.843	.0002	.0021	1.36	.870	.816	
		(−4.78884)	(2.27831)	(4.941450)	(.477920)	(.23367)							
(8)	UR. FRS/Pot. GNP	−.17187	.00139	.000088	.000000	.00003	.900	.0003	.0019	1.44	2.551	2.064	
		(−5.01816)	(.51871)	(5.253900)	(11.419730)	(1.68127)							
(9)	UR. Other/Pot. GNP	−.01423	−.00140	.000008	.000000	.00002	.209	.0002	.0003	2.06	1.051	1.774	
		(−.68416)	(−.85834)	(.797743)	(.036740)	(1.44419)							
(5′)	UR. Ex*/Pot. GNP	1.34158	.01169	−.000679	.000237	−.07804	.903	.0010	.0201	.....	3.782	.683	.560
		(10.31010)	(1.32687)	(−10.460000)	(.435190)	(−1.22246)							
(6′)	UR. E&G*/Pot. GNP	−.00364	.00345	.000002	.000228	−.00000	−.043	.0005	.0033	.....	4.186	5.697	.611
		(−.05762)	(.83725)	(.053750)	(.884940)	(−.11991)							

*Alternative estimate corrected for first-order serial correlation using generalized least squares.

Notes to the Tables

A. Organization

The tables in this appendix are numbered to correspond to the outline of the presentation in the paper itself. Since the organization of such a large mass of data as is examined here is of prime importance for intelligibility, it might be well to present the organizational plan that was used. It is as follows:

I. Budget expenditures.
  A. Budget shares.
    1. NIA budget.
    2. Unified Budget.
      a. Functional categories (050, . . . , 950).
      b. Particular subfunctions of interest.
      c. Controllable-uncontrollable categorization.
  B. Ratios to potential GNP.
    1. NIA budget.
    2. Unified budget.
      a. Functional categories (050, . . . , 950).
      b. Particular subfunctions of interest.
      c. Controllable-uncontrollable categorization.
II. Budget receipts.
  A. Budget shares.
    1. NIA budget.
    2. Unified budget.
  B. Ratios to potential GNP.
    1. NIA budget.
    2. Unified budget.

Thus for example Table I.B.2.a. contains regressions for the ratios of each of the particular unified budget functional outlay categories (050 through 950) to potential GNP.

B. Presentation

1. Table structure.—The data in each table are presented in essentially the same way, the only important difference among the tables being that the dummy variables used in the spending equations are different than those used in the tax equations, as explained in the text.

Below each estimated coefficient, in parentheses, is its t-ratio reflecting the size of the estimated coefficient relative to its standard error. In discussing the results, I follow the usual rule of thumb that a t-ratio of 2 or greater in absolute value signifies that the corresponding coefficient is significantly different from zero.

For each equation in the basic set of estimates (i.e., the ones shown in each table above the double line) is given a standard set of statistics: The equation's coefficient of determination (adjusted for degrees of freedom), $\bar{R}^2$; the standard error of estimates, S.E.E.; the mean value of the dependent variable in the equation, $\bar{Y}$; the Durbin-Watson statistic, D.W., and Chow test statistics calculated alternatively for potential structural change occurring at 1965 and at 1969.

For six elements in the parameter vector and 32 observations, the lower and upper bounds of the region of indeterminacy as regards the possible presence of autocorrelation in the regression residuals are Durbin-Watson statistics valued respectively 1.11 and 1.82 at the 5-percent confidence level, and .92 and 1.60 at the 1-percent level. In this study I have reestimated particular equations using generalized least squares and a first-order autocorrelation transformation if the Durbin-Watson statistic was less than about 1.03. (In general I have avoided reestimating in this way because it does not preserve the adding up-property which characterizes the ordinary least squares estimates. See the discussion in the text on this point.) These estimates which include an autoregressive transformation are shown following the basic set of estimates in each table, and they are numbered by adding a prime to the number of the corresponding basic equation. The autoregressive parameter is given for these equations.

As to the Chow test for structural change, the following tabulation gives the relevant critical values:

Period	F statistic	Confidence level	
		5 percent	1 percent
1947–78	F(4, 22)	5.79	14.00
1948–78	F(4, 21)	5.79	14.00
1962–78	F(4, 8)	6.04	14.80

When a structural change is indicated, the subperiod regression results are given following the main set of results and the autoregressive equations. If the Chow statistic indicated structural change as of both 1965 and 1969, I have selected the year with the larger F-ratio as the break point. These subperiod equations have the same number as their full-period counterpart, with the subperiod indicated by a "1" or "2" following the equation number.

2. Symbols used.—It was necessary to develop a set of symbols to represent the dependent variables in the regressions. Following is a key to those symbols.

First, I have characterized spending and revenues under the different budgets in a standard way, as follows:

E NIA budget expenditures.
T NIA budget receipts.
UO Unified budget outlays.
UR Unified budget receipts.

These are the quantities that appear in the denominators of the dependent variables in the budget share regressions.

To define particular spending or tax programs (the numerators of the dependent variables in the regressions), I have used modifying letters or numbers along with the basic budget symbols. Following is a listing of the full symbol for each particular program, and its definition:

E.Def	Defense purchases of goods and services, NIA budget.
E.Nondef	Nondefense purchases of goods and services, NIA budget.
E.DomTr	Domestic transfer payments to persons, NIA budget.
E.ForTr	Transfer payments, foreign, NIA budget.
E.Grants	Grants-in-aid to state and local governments, NIA budget.
E.NetInt	Net interest paid, NIA budget.
E.Other	Subsidies less current surplus of Government enterprises plus wage disbursements less accruals, NIA budget.
T.Pers	Personal taxes and nontax receipts, NIA budget.
T.Corp	Corporate profit tax accruals, NIA budget.
T.IndBus	Indirect business tax and nontax accruals, NIA budget.
T.SocIns	Contributions to social insurance, NIA budget.
UO.050	Outlays for national defense, unified budget.
UO.150	Outlays for international affairs, unified budget.
UO.250	Outlays for general science, space, and technology, unified budget.
UO.270	Outlays for energy, unified budget.
UO.300	Outlays for natural resources and environment, unified budget.
UO.350	Outlays for agriculture, unified budget.
UO.370	Outlays for commerce and housing credit, unified budget.
UO.400	Outlays for transportation, unified budget.
UO.450	Outlays for community and regional development, unified budget.
UO.500	Outlays for education, training, employment, and social services, unified budget.
UO.550	Outlays for health, unified budget.
UO.600	Outlays for income security, unified budget.
U0.700	Outlays for veterans benefits and services, unified budget.
U0.800	Outlays for general government, unified budget.
U0.850	Outlays for general purpose fiscal assistance, unified budget.
U0.900	Interest payments, unified budget.
U0.950	Undistributed offsetting receipts, unified budget.
0.1	Outlays for military personnel, unified budget (Function 051—military personnel).
0.2	Outlays for retired military personnel, unified budget (Function 051—retired military personnel).
0.3	Outlays for national defense other than on active and retired military personnel, unified budget (Function 051—operation and maintenance, procurement, research and development, military construction, and other).

0.4	Outlays for ground transportation, unified budget (Function 401).
0.5	Outlays for air transportation, water transportation, other transportation, and deductions for offsetting receipts (DFOR), Function 400, unified budget (Functions 402, 403, 407, and DFOR).
0.6	Outlays for elementary, secondary, higher, and vocational education, unified budget (Functions 501 and 502).
0.7	Outlays for training, employment, and other labor services, unified budget (Functions 504 and 505).
0.8	Outlays for health care services, unified budget (Function 551).
0.9	Outlays for Social Security, unified budget (Function 601—Social Security).
0.10	Outlays for Federal employee retirement and disability, unified budget (Function 602).
0.11	Outlays for unemployment compensation, unified budget (Function 603).
0.12	Outlays for public assistance and other income supplements, unified budget (Function 604).
0.13	Outlays for interest on the public debt less interest received by trust funds, unified budget (Function 901 plus Function 952).
U.1	Social Security and railroad retirement payments to individuals, unified budget.
U.2	Federal employees retirement and insurance payments to individuals (military and other), unified budget.
U.3	Unemployment assistance payments to individuals, unified budget.
U.4	Veterans benefits: pensions, compensation, education, and insurance, unified budget.
U.5	Medicare and medicaid payments to individuals, unified budget.
U.6	Housing payments to individuals, unified budget.
U.7	Payments to individuals under public assistance and related programs, unified budget.
UR.Pers	Individual income tax receipts, unified budget.
UR.Corp	Corporation income tax receipts, unified budget.
UR.SocIns	Social insurance taxes and contributions, unified budget.
UR.Ex	Excise tax receipts, unified budget.
UR.E&G	Estate and gift tax receipts, unified budget.
UR.Cust	Customs duties, unified budget.
UR.FRS	Deposits of earnings by the Federal Reserve System, unified budget.
UR.Other	All other budget receipts, unified budget.

CHANGES IN THE FINANCING OF THE FEDERAL DEBT AND THEIR IMPACT ON THE U.S. ECONOMY, 1948–90

By Carl F. Christ*

CONTENTS

TABLES

*The Johns Hopkins University.

FIGURES

ACKNOWLEDGMENTS

I am especially indebted to Elizabeth Fogler of the Flow of Funds Section of the Federal Reserve staff for patient and detailed help in understanding the flow of funds accounts, including the definitions of the sectors and of the myriad stock, flow, and discrepancy items that appear, and for preparing the computer-printed tables and charts below according to my instructions. Stephen Taylor and Judith Ziobro of the Flow of Funds Section and Stanley Sigel, formerly of that section and now Assistant to the Board, were also very helpful. Any conceptual errors are my responsibility.

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I. Summary, Introduction, and Main Recommendations

A. Summary

The current U.S. inflation could not have happened without an important and substantial change in the financing of the Federal debt. This change was begun in 1961, and was accelerated after 1965. It produced a temporary boom and a short-run improvement in unemployment in 1966–69, but that improvement has long since worn off.

In the 1970's we were left with considerably more inflation than in 1960, and no better unemployment.

What was this important change in U.S. Government debt financing? It was a substantial increase in the Federal Reserve's rate of purchases of Treasury securities. Such purchases are paid for chiefly with newly created additions to the monetary base (high powered money), created by the Federal Reserve for that purpose. Thus the growth rate of the monetary base was substantially increased, especially after 1965. That is a sure recipe for inflation, whatever its other effects.

Federal budget deficits have become more common since 1965. And their size in proportion to gross national product (GNP) has grown. Indeed, in 1975 the deficit was 4.6 percent of GNP, a higher percentage even than during the Great Depression of the thirties. Deficits are not very inflationary as long as they are financed by sales of securities to private and foreign investors rather than to the Federal Reserve. However, deficits do increase the amount of debt that has to be financed. This may lead the Federal Reserve to buy more of it than price stability would dictate. Also, large persistent deficits are likely to result in the crowding out of some private capital investment, thus reducing future growth.

The period since World War II falls into three parts, concerning macro-economic policy. First, from 1948 to 1960 the growth rate of the monetary base was kept under 1 percent a year on the average, and the average inflation rate measured by the consumer price index (CPI) was under 2 percent a year. Second, in 1961–65 there was a transition to more rapid growth of the monetary base. Third, from 1966 to October 1979, the growth rate of the monetary base was further increased, exceeding 8 percent a year in the late seventies, and the inflation rate rose to the same range.

It is perfectly possible to stop inflation and achieve an approximately constant price level. What is required is to reduce the use of monetary expansion as a means of financing the Federal debt. We should return to very slow and fairly steady growth rates for the monetary base and other stocks of money. They should average about 1 to 3 percent a year after a transition phase. A gradual policy carried out over a period of 5 to 10 years will be best. It will begin to be successful after we pass through one recession and recovery without abandoning it, so that the public will believe that it will be adhered to.

At this writing the Federal Reserve appears to have embarked on such a policy beginning in October 1979. At first it is likely to cause a temporary reduction in output and employment (the reverse of the 1966–69 boom). Such adverse cyclical effects can be ameliorated by a temporary slowdown in the reduction of monetary growth (provided the long-run goal is met) and by a temporary budget deficit.

A reduction in the average level of Federal budget deficits would be desirable, to at most about 0.5 percent of GNP on the average over the business cycle. The budget should not be balanced at all times. To ameliorate the business cycle, it should be in deficit during recessions and in balance or in surplus during prosperity.

This paper supports these statements with a description of the relationships between Federal debt financing and such important variables as output, employment, the several stocks of money, inflation, interest rates, the exchange rate, and the balance of payments;

with annual data on the Federal deficit and its financing from 1946 through 1979, in nominal and real terms and as a ratio to GNP; and with an analysis of our present difficult macroeconomic situation, how we got into it, and how we can get out of it. Conditional predictions are offered for the period from 1980 to 1990.

B. Introduction

The financing of the Federal debt is of high importance to the economy. This is because of its close direct relations with (*a*) the amount of Federal debt securities in domestic private and foreign hands, (*b*) the monetary base (sometimes called the high powered money stock), (*c*) several other stocks of money, and (*d*) the country's stock of gold, SDR's and foreign exchange, Through these asset stocks and in other ways, the Federal debt is related to such important variables as employment, output, the rate of inflation, interest rates, and the international value of the dollar.

In sections II and III we describe in a simplified way the essential nature of the relationships between Federal debt financing and these important asset stocks. In section II we emphasize the domestic relationships, temporarily assuming for simplicity that the U.S. is involved in no international claims or transactions. In section III we bring economic relations with the rest of the world into the picture. In each of these sections we make use of a table of intersectoral claims that embodies the balance sheets of each of the four sectors into which we divide the economy. From the year-to-year change in the balance sheet of the U.S. Government sector (including the Federal Reserve System) is derived an important relationship called the *Government budget restraint.* It says that the Government's decisions about spending, taxing, printing money, borrowing, spending reserves of gold and foreign exchange, etc., cannot all be made independently. This is because the total of government spending must be equal to the total of government financing from all sources. Such restraint plays a leading role in explaining the relations between the financing of the Federal debt and the behavior of the economy.

In section IV we present annual data for the variables in the U.S. Government budget restraint for 1946 through 1979. They are based on the flow of funds accounts that are published by the Federal Reserve System.

In section V we discuss the macroeconomic effects of Federal debt financing upon the stocks of money, inflation, employment, interest rates, exchange rates, and the balance of payments.

In section VI we venture some conditional projections for the U.S. economy to 1990, indicating what kinds of policies will lead to the perpetuation or acceleration of inflation, and what kinds will lead to price stability.

The appendix describes the manner in which we obtained the consolidated U.S. Government and Federal Reserve sector by combining the U.S. Government sector and the monetary authorities sector as they are defined in the flow of funds accounts.

A supplementary note discusses some aspects of Federal debt management that are related, but not central, to the subject of this paper.

C. Main Recommendations

A number of recommendations are made in the course of this paper. For convenience the main ones are given here, together with a reference to the subsection where each may be found:

1. For the long run, the Federal Reserve should provide noninflationary and fairly steady growth of the stocks of money. To reach this long-run state, the growth rates of the money stocks must be reduced from their recent range of 6 to 10 percent a year to their 1948–60 range of around 1 to 3 percent a year. (The noninflationary growth rates will not be the same for the several stocks of money.) This transition should be accomplished gradually, over a period of 5 to 10 years, by small reductions averaging 0.5 to 1 percent each year. The transition should not be reversed in the event of a recession, but it could be temporarily slowed, provided the long-run goal is met. (See section I.A, V.D, V.E, and VI.)

2. For the short run, the money stocks should not be permitted to rise very fast in booms, nor to decline during recessions. (During the transition mentioned just above, they should not be permitted to decline more rapidly in recession than at other times.) (See section I.A. and V.D.)

3. For the long run, the Congress should reduce the frequency and average size of Federal budget deficits, so that on the average over the business cycle they amount to at most about 0.5 percent of gross national product (GNP). (See section I.A., V.D, V.E, and VI.)

4. For the short run, the size of the deficit should not be made the same every year. In particular, a Constitutional amendment to require a balanced budget every year would be pernicious. There should be deficits during recessions, and surpluses or roughly balanced budgets during business cycle peaks. (See section I.A, V.E, and VI.)

5. The Federal Reserve should not attempt to control interest rates directly, but rather should secure their decline by following recommendation 1 above. (See section V.F.)

6. The Congress should provide for the gradual increase and final abolition of statutory ceilings on interest rates (See section V.G. and supplementary note.)

7. The minimum wage law should be abolished, or at least amended to exclude teenagers and young adults. (See section VI.)

8. Unemployment compensation should be made to start after a few weeks of unemployment rather than immediately, and to continue longer than at present. (See section VI.)

II. The Essential Relation Between the Federal Deficit and Asset Stocks in a Closed Economy

A. Introduction

In sections II and III we describe in a simplified way the important relationship between Federal debt financing and the asset stocks that influence inflation, output, employment, interest rates, and

international economic events. The essence of this relationship is most clearly seen in an economy that is closed to all foreign transactions. This is the subject of section II. Foreign transactions are introduced in section III.

There are three main points in section II concerning a closed economy. First, the Congress and the executive branch, together with the private sector, determine the Federal budget deficit (or surplus). Second, the deficit (or surplus) is matched by an equal net increase (or decrease) in the sum of private holdings of Federal debt plus the monetary base. Third, the Federal Reserve cannot control this sum, but does control its composition as between private holdings of Federal debt and the monetary base.

We will argue later that over any long period, by its control of the monetary base, the Federal Reserve controls the rates of growth of the other money stocks and the rate of inflation.

B. Balance Sheets for a Simple Closed Economy

In section II we will consider only the bare essentials of monetary and fiscal policy action in a closed economy. The Federal Government makes expenditures and sets tax rates. It issues debt if it has a deficit, and retires debt if it has a surplus. That is all we permit it to do in this section. In particular, it holds no assets.

The Federal Reserve holds a portfolio of Federal Government securities, balanced by a liabliity in the form of the monetary base. The base is held partly by banks in the form of reserves and partly by nonbank private agents in the form of currency. The Federal Reserve buys and sells Federal securities, issuing new additions to the monetary base when it buys, and retiring part of the monetary base when it sells. That is all we permit it to do in this section.

The rest of the domestic economy will be called the private sector. It holds all of the monetary base, and some of the outstanding Federal securities (those not held by the Federal Reserve). It goes about its business of producing, consuming, saving, and investing. Our consolidation of the private banks and all other private agents in a single private sector serves well to bring out the main points of sections II and III, but of course it suppresses detail that is useful for other purposes.

The balance sheets of all three sectors are displayed in table 2.1. There is a row for each sector, containing its liabilities, and a column for each sector, containing its assets. There are a row and a column for a fictitious sector called the capital account which by construction holds the net worths of all other sectors as its assets and carries all physical assets as its liabilities. Every balance-sheet item is a claim of some sector against another. All claims of A against B are in A's column and B's row, while all claims of B against A are in B's column and A's row. Thus the balance sheet of any sector can be read from its column (assets) and row (liabilities). For example, the private sector's balance sheet can be read as follows:

Private sector assets:	Private sector liabilities:
Treasury securities	Net worth.
Monetary base	
Physical assets	
Total assets.	Total liabilities.

TABLE 2.1.—INTERSECTORAL CLAIMS IN A SIMPLIFIED CLOSED ECONOMY

	Assets of—				
	Private sector	Federal Government (excluding Federal Reserve)	Federal Reserve	Capital account	Total
Liabilities of—					
Private sector	----------	0	0	Net worth of private sector.	Net worth.
Federal Government (excluding Federal.	Federal securities held by private sector.	----------	Federal securities held by Federal Reserve.	Net worth of Federal Government (negative).	Total Federal securities plus net worth of Federal Government equals 0.
Federal Reserve	Monetary base	0	----------	0	Monetary base.
Capital account	Physical assets	0	0	----------	Physical assets.
Total	Federal securities held by private sector plus monetary base plus physical assets.	0	Federal securities held by Federal Reserve.	Net worth of private sector plus net worth of Federal Government.	Grand total.

Note: Each sector's balance sheet can be read from this table, assets from the sector's column, and liabilities from its row.

C. The Government Budget Restraint for a Simple Closed Economy

We are now ready to develop the relation of the Federal budget deficit or surplus to private holdings of Federal debt and the monetary base.

First, note that the Federal debt came into existence because of Federal deficits in the past. Further deficits increase the debt, and surpluses decrease it. The debt is held partly by the private sector and partly by the Federal Reserve (as shown by the Government sector's row in table 2.1). Therefore we have this simple equation:

Federal deficit=net increase in combined holdings of Federal debt by the private sector and the Federal Reserve (2.1)

This equation can equally well be expressed in terms of the Federal surplus, rather than the deficit, thus:

Federal surplu=net decrease in combined holdings of Federal debt by the private sector and the Federal Reserve (2.2)

Since a negative surplus is the same as a positive deficit, and vice versa, it is clear that equations (2.1) and (2.2) say the same thing: either one can be obtained by multiplying both sides of the other by -1. When the budget is in deficit, both sides of (2.1) are positive numbers, and both sides of (2.2) are negative. When the budget is in surplus, the reverse is true. In what follows, we will usually use (2.1) and speak of the deficit, even when it is negative. But sometimes, especially when discussing the national income accounts and the flow of funds accounts, we will follow their practice and use (2.2), and speak of the surplus, even when it is negative.

The deficit is determined by the Congress and the Executive Branch, interacting with the private sector. Therefore, because of equation (2.1), the same process determines the net increase of the combined Federal debt holdings by the private sector and the Federal Reserve.

The essential function of the Federal Reserve is to decide how much of this combined total of Federal debt is to be held by the private sector, and (by subtraction) how much is to be held by the Federal Reserve itself. It does this by buying or selling Federal securities in return for high powered money. When it buys, it creates additional new high

powered money, and when it sells, it retires high powered money, in amounts equal to the value of the purchase or sale. Therefore we have another simple equation:

increase in Federal Reserve holdings of Federal debt equals increase in the monetary base (2.3)

Now replace the increase in the Federal Reserve's holdings of Federal debt in (2.1) by the equal increase in the monetary base from (2.3), and obtain the following equation:

Federal deficit equals increase in Federal debt holdings by the private sector plus increase in the monetary base (2.4)

This important relation is called the *Government budget restraint.* It says (in this simplified world) that the budget deficit must be equal to the increase in the total of two types of asset held by the private sector: Federal securities and the monetary base.

Another useful interpretation of the Government budget restraint follows. Consolidate the U.S. Government and the Federal Reserve into a single sector, netting out the only claim between them (Federal debt). Next, take the first difference (that is, the year-to-year change) of the balance sheet of this consolidated government sector. Finally, replace the net increase in the sector's net worth by the negative of the Federal budget deficit. The result is the Government budget restraint (2.4).

To summarize, the role of the Congress and the Executive is to control the size of the deficit, and therefore to control the change in the private sector's total holdings of Federal debt and monetary base, without controlling the composition of the total. The role of the Federal Reserve is to control the mix of this total as between privately held government debt and the monetary base, without controlling the total itself. This kind of division of responsibility requires cooperation to achieve success.

The budget deficit and the monetary base are among the most important variables that economic policy deals with. Their effects on employment, output, inflation, interest rates, and international economic events will be dealt with in later sections. But first, in section III, we must take international transactions and claims into account.

III. The Essential Relation Between the Federal Deficit and Asset Stocks in an Open Economy

A. Introduction

In this section we extend the discussion to an economy that is open to foreign transactions. The results are similar to those obtained in section II for a closed economy, except that there is now an additional market, the foreign exchange market. The authorities can either fix the exchange rate and let the balance of payments fluctuate, or fix the balance of payments at zero and let the exchange rate float freely, or follow a middle course: A managed (or "dirty") float.

B. Balance Sheets for a Simple Open Economy

In section III we consider the bare essentials of monetary and fiscal policy action in an economy that is open to foreign transactions, but is otherwise as simple as the one in section II. The foreign sector

(consolidated public and private) is assumed to hold some of our country's government debt and monetary base, as well as some physical assets; its liabilities consist of its net worth and some of its money which is held by our government as a foreign exchange reserve. Table 3.1 shows the assets (in columns) and liabilities (in rows) of each sector, on the same plan as table 2.1. Of course, table 3.1 has a new row and column representing the foreign sector.

TABLE 3.1.—INTERSECTORAL CLAIMS IN A SIMPLIFIED OPEN ECONOMY

	Assets of—				
Liabilities of—	Private sector	Federal Government (including Federal Reserve)	Foreign sector	Capital account	Total
Private sector	0	0	Net worth of private sector.	Net worth.
Federal Government (including Federal Reserve).	Private holdings of monetary base and Federal securities.		Foreign holdings of monetary base and Federal securities.	Net worth of Government sector.	Total monetary base plus Federal securities, plus net worth of Government sector.
Foreign sector	0	Foreign exchange reserves.		Net worth of foreign sector.	Foreign exchange reserves plus foreign net worth.
Capital account	Private physical assets.	0	Foreign physical assets.		Total physical assets.
Total	Private holdings of monetary base, Federal securities, plus physical assets.	Foreign exchange reserves.	Foreign holdings of monetary base, Federal securities, plus physical assets.	Total net worth.	Grand total.

Note: Each sector's balance sheet can be read from this table, assets from the sector's column and liabilities from its row.

For convenience we have consolidated the Federal Government and Federal Reserve sectors into a single sector. This consolidation causes no difficulty, for the claims and transactions that are thus netted out are of no great interest for our purpose. Recall that the important relationship in section II, the Government budget restraint (2.4), deals with the consolidated Government sector.

The balance sheet of each sector can be read from Table 3.1. For example, the balance sheet of the consolidated Government sector can be read as follows:

Government assets:	Government liabilities:
foreign exchange reserves	monetary base (held by private and foreign sectors).
	Federal Government debt (held by private and foreign sectors).
	Government net worth (negative).
Total assets.	Total liabilities.

C. The Government Budget Restraint for a Simple Open Economy

We are now ready to present the relation of the Federal deficit to the amounts of private and foreign holdings of Federal debt, the monetary base, and the stock of foreign exchange reserves. As before, this

relation is the first difference (i.e., the year-to-year change) of the balance sheet of the consolidated Government sector, thus:

Federal deficit = increase in private and foreign holdings of Federal debt + increase in the monetary base − increase in foreign exchange reserves (3.1)

As before, it is called the Government budget restraint. This time it says (in this still simplified world) that the Federal deficit must be equal to the increase in the net total of Federal debt and monetary base held by the private and foreign sectors minus the increase in U.S. foreign exchange reserves.

As before, the Congress and the Executive (interacting with the private sector and now with the foreign sector too) determine the size of the budget deficit and therefore determine the net flow given by the right side of the Government budget restrait (3.1)without determining its composition. As before, the Federal Reserve's role is to control the composition of the net asset total whose net increase appears as the right side of (3.1), without controlling the total itself. Again there is a division of responsibility.

But now the Federal Reserve has three types of assets to deal with and two degrees of freedom in its actions, rather than (as in the closed economy of section II) two types of asset and one degree of freedom. It can still buy and sell Federal securities in return for high powered money, as before, but now it can also buy and sell foreign exchange as well.

Under a fixed exchange rate, one degree of freedom is used up in choosing the rate and in buying and selling whatever amounts of foreign exchange will maintain that rate; the other degree of freedom allows the Federal Reserve to buy or sell Federal securities in return for high powered money as in a closed economy.

Under a freely (cleanly) floating exchange rate, one degree of freedom is used up in holding foreign exchange reserves constant (possibly zero) so that the rate will be determined freely by market forces. The other degree of freedom is available as before for trading Federal securities for high powered money.

Under the more general situation of a managed (or "dirty") float, the Federal Reserve can determine the levels of any two of the three assets in the Government budget restraint (3.1); namely, Federal securities in private and foreign hands, the monetary base, and U.S. foreign exchange reserves. The third asset level will be determined by the operation of the Government budget restraint and past levels of the three assets.[1]

D. A Net Surplus Identity for an Open Economy

For any open economy, national accounting conventions require that the surpluses and deficits of the three sectors (private, government, and foreign) be related as follows:

excess of private investment over private saving plus government budget deficit plus excess of exports over imports equals 0 (3.2)

[1] The five preceding paragraphs of this subsection are written for the case where the Federal Reserve, not the Treasury, holds the foreign exchange reserves and deals on the foreign exchange market. If the Treasury does this, instead of the Federal Reserve, the balance sheets in table 3.1 and the Government budget restraint (3.1) are not affected, because we have consolidated the Federal Reserve with the Government; the only difference would be that the Federal Reserve would lose the degree of freedom representing foreign exchange transactions, and the Treasury would gain it.

This is because GNP can be expressed either as the sum of consumption plus private gross investment plus government purchases of goods and services plus net exports, or as the sum of consumption plus private gross saving plus taxes less transfers. Subtracting one of these sums from the other and rearranging terms results in equation (3.2). Of course private saving and private investment must both be defined in the same way with respect to depreciation: either both gross or both net. If the deficit in (3.2) applies to the Federal Government only, then State and local governments must be included in the private sector (as is done in this paper).

Equation (3.2) is a useful reminder that policy actions influencing the Government budget deficit must also influence the deficit and/or surplus of one or both of the other two sectors. In the closed economy of section II equation (3.2) would always hold, but the excess of exports over imports would always be zero.

IV. Financing the U.S. Government Deficit, 1946–79

A. Introduction

In sections II and III we considered the bare essentials of fiscal and monetary policy action. We found that fiscal actions, interacting with other actions, determine the budget deficit. The deficit then determines (is equal to) the increase in the net liabilities of the consolidated government sector that are held by the private sector and the rest of the world. The three important assets and liabilities that we considered in section III were the Federal debt in private and foreign hands, the monetary base, and U.S. foreign exchange reserves. In section IV we develop the corresponding relation for the actual U.S. economy.

The relationship that will emerge from section IV gives the Federal budget deficit (NIA basis) as the sum of the items shown (with appropriate algerbraic signs) in table 4.1. Lines 5, 6, and 7 correspond to the three terms on the right side of equation (3.1). The remaining items in table 4.1 were assumed away for simplicity in the discussion of sections II and III. They will be explained below.

TABLE 4.1.—U.S. GOVERNMENT BUDGET RESTRAINT, SHOWING THE FINANCING OF THE U.S. GOVERNMENT DEFICIT, WITH DATA FOR 1979

[In billions of dollars per year]

Line	Add or subtract	Item	1979 flow
1		Total: U.S. Government deficit, national income accounting (NIA) basis	11.450
2	Subtract	Increase in Treasury deposits at commercial banks	.490
3	Subtract	Increase in Federal Reserve loans to member banks	.282
4	Subtract	Increase in U.S. Government loans except to member banks	30.400
5	Subtract	Increase in U.S. reserves of gold, SDR's, and foreign exchange	—.578
6	Add	Increase in the monetary base (high powered money)	9.524
7	Add	Increase in U.S. Government debt held in private and foreign hands	30.320
8	Add	Mineral rights sales by U.S. Government	4.745
9	Add	Increase in financial net worth of monetary authorities	.390
10	Subtract	Statistical discrepancy between national income accounts (NIA) and flow of funds accounts (FofF)	2.935

Source: Table 4.3. See text of section IV.B for explanation.

We use the national income accounts (NIA) definition of the budget deficit. We use the flow of funds (FofF) accounts for the U.S. Government and the monetary authorities,[2] which we consolidate into a single government sector as in table 3.1. In table 4.3 we present annual data for the period from 1946 through 1979, corresponding to table 4.1, showing in detail how the Federal deficit was financed. In section V we use these data to interpret the change from relatively stable prices in 1948–60 to continuous inflation in 1966–79. In section VI we venture some projections for 1980–90, indicating what types of financing will be consistent with continued inflation and what types will be consistent with a return to price stability. Output, employment, interest rates, and the international value of the dollar will also be considered.

B. Derivation of the Empirical U.S. Government Budget Restraint

The U.S. Government budget restraint, which shows the financing of the budget deficit as in table 4.1, is derived as follows from NIA and FofF data. In the derivation we follow the official statistics and speak of the surplus rather than the deficit. At the end of the derivation we will reverse all the signs to obtain the Government budget restraint in terms of the deficit.

The FofF accounts are used because they provide consistent stock and flow accounts for both the U.S. Government and the monetary authorities, which we want to consolidate into a single sector.[3]

Step one in the derivation is to reconcile the U.S. Government surplus on the NIA basis with the change in the financial net worth of the U.S. Government of the FofF basis. This has already been done in the FofF accounts as follows. (The figures accompanying the next several equations are flows for the year 1979 in billions of dollars, from table A. 2.)[4]

U.S. Govt surplus (NIA basis) (−11.450) equals increase in life and retirement insurance reserves (8.303) minus mineral rights sales by U.S. Government (4.745) plus FofF discrepancy (2.935) plus increase in financial net worth of U.S. Government (−17.943) (4.1)

Note that the FofF Accounts ignore nonfinancial assets altogether. That is, the FofF balance sheet lists only financial assets on its asset side, and shows financial net worth rather than total net worth on its liability side; financial net worth is defined as total net worth minus the value of nonfinancial assets. Thus the balance sheet still balances.

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[2] See Board of Governors [1975] for explanation, and [1976] or [1978] for tables of annual stock and flow data.

[3] In the FofF accounts, the monetary authorities sector is defined as the Federal Reserve plus the monetary accounts of the Treasury; the latter are accordingly not included in the U.S. Government sector in the FofF accounts. This causes us no difficulty, because we are interested in the consolidation of the two accounts, which is not affected by the transfer of the Treasury's monetary accounts.

[4] Several points should be noted about this relationship. First, annual data for it can be found in the FofF table of annual flows for the U.S. Government sector, lines 10, 11, 13, 36, and 15; see Board of Governors [1976], pages 22–24, or [1978], table 46. Updated data for 1946–79 can be found below in table A.2, lines 48–52. Second, the item that is here called "increase in financial net worth of U.S. Government" is called "net financial investment" [of the U.S. Government] in the FofF publications just cited. Third, the item "increase in life and retirement insurance reserves" refers to reserves of the U.S. Government employees' insurance system and the railroad retirement insurance system, but not social security. (See Board of Governors [1975], p. 31.) Fourth, the item "mineral rights sales of U.S. Government" consists mainly of receipts from offshore oil leases. It is not included in government receipts on the NIA basis (presumably because it is not a payment for productive services rendered by factors of production), but it is treated as revenue in the FofF accounts. Fifth, the remaining discrepancy is discussed in Board of Governors [1975], pp. 30–34.

Step two is to consolidate the FofF balance sheet accounts of the U.S. Government sector and the monetary authorities sector by netting out all claims between them so that the only claims vis-a-vis the consolidated sector are claims vis-a-vis the private sector, the foreign sector, and the capital account. Details of the consolidation are given in the appendix. The result is the following balance sheet equation for the consolidated U.S. Government and monetary authorities sector.[5]

Treasury deposits at commercial banks plus member bank borrowing plus U.S. Government loans except to member banks plus gold, SDR's, and foreign exchange equals monetary base plus U.S. Government debt in private and foreign hands plus life and retirement insurance reserves plus financial net worth of U.S. Government plus financial net worth of monetary authorities (4.2)

The network of intersectoral claims corresponding to this consolidation is given in table 4.2.

TABLE 4.2.—INTERSECTORAL CLAIMS UNDERLYING THE U.S. GOVERNMENT BUDGET RESTRAINT IN TABLE 4.1

	Financial assets of—			
Liabilities of—	Private domestic sector	Government sector including monetary authorities	Foreign sector	Capital account excluding physical assets
Private domestic sector		Treasury deposits at commercial banks; loans to member banks; U.S. Government loans to private domestic sector.	0	Financial net worth (private domestic).
Government sector including monetary authorities.	Monetary base privately held; U.S. Government debt privately held; life and retirement insurance reserves.		Monetary base held by foreign sector; U.S. Government debt held by foreign sector.	Financial net worth of U.S. Government including monetary authorities.
Foreign sector	0	U.S. Government loans to foreign sector; U.S. foreign exchange, gold, and SDR reserves.		Financial net worth of foreign sector.
Capital account excluding physical assets.	0	0	0	

Note: Each sector's financial balance sheet can be read from this table, financial assets from the sector's column and liabilities from its row. In order to save space, the row and column totals are not printed.

Step three is to solve the foregoing balance sheet equation (4.2) for the financial net worth of the consolidated U.S. Government and monetary authorities sector, thus:

Financial net worth of U.S. government plus financial net worth of monetary authorities equals Treasury deposits at commercial banks plus member bank borrowing plus U.S. government loans except to member banks plus gold, SDR's, and foreign exchange minus monetary base minus U.S. government debt in private and foreign hands minus life and retirement insurance reserves (4.3)

[5] The item "gold, SDR's, and foreign exchange" includes the IMF gold tranche of the United States. Data for equations (4.2)–(4.3) are in table A.1, lines 56–61, 49, 52 and 54.

Step four is to write down the annual flows version of the preceding consolidated U.S. Government sector balance sheet equation (4.3):[6]

Increase in financial net worth of U.S. government (−17.943) plus increase in financial net worth of monetary authorities (0.390) equals increase in Treasury deposits at commercial banks (0.490) plus member bank borrowing (0.282) plus U.S. government lending except to member banks (30.400) plus increase in gold, SDR's and foreign exchange (−.578) minus increase in the monetary base (9.524) minus increase in U.S. government debt in private and foreign hands (30.320) minus increase in life and retirement insurance reserves (8.303) (4.4)

Step five is to substitute, for the increase in financial net worth of the U.S. Government in equation (4.1), the equivalent expression obtained from equation (4.4). This yields an expression for the U.S. Government surplus (NIA basis) in terms of the changes in the assets and liabilities in the balance sheet of the consolidated government sector. It is the U.S. Government budget restraint expressed in terms of the Federal surplus. Data for it are shown in table 4.3.

Step six is to multiply the equation obtained in step five by −1, thus obtaining the U.S. Government budget restraint expressed in terms of the Federal deficit, as follows:

U.S. government deficit (NIA basis) (11.450) equals minus increase in Treasury deposits at commercial banks (0.490) minus member bank borrowing (.282) minus increase in U.S. government loans except to member banks (30.400) minus increase in U.S. gold, SDR's, and foreign exchange reserves (−.578) plus increase in the monetary base (9.524) plus increase in U.S. government debt in private and foreign hands (30.320) plus mineral rights sales by U.S. government (4.745) plus increase in financial net worth of monetary authority (0.390) minus NIA–FofF discrepancy (2.935) (4.5)

This corresponds precisely to table 4.1, and to (−1) times table 4.3.

C. Tables of Data for 1946–79

Tables 4.3 to 4.6 present annual data for the U.S. Government budget restraint for 1946–79, inclusive, including the same components of the Government deficit as are shown in table 4.1. Table 4.3 gives nominal data in billions of dollars. It is the same as lines 55–64 of table A.2. Table 4.4 gives real data in billions of 1972 dollars using the implicit GNP deflator. Table 4.5 expresses the budget deficit and its components as ratios to GNP. Table 4.6 expresses them as ratios to the financial net worth of the U.S. Government and monetary authorities at year-end. (This net worth is negative; hence these ratios are negative in years when there was a deficit, and positive in years when there was a surplus.)

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[6] The source is the FofF tables of annual flows for the U.S. Government and monetary authorities sectors; see table A.2, lines 52, 54, 56–61, and 49. The consolidation is done on the same principles as that for the preceding equation. The annual flows are not always equal to the first differences of the stocks, for two reasons. First, asset revaluations are not recorded in the flow accounts, though they do affect the stocks and hence the first differences. Important examples of this are the issue of SDR's by the IMF to the U.S. Government, the revaluation of the gold stock, and write-offs of foreign-aid loans as bad debts. In each case it is the flows we want in the government budget restraint, not the first differences of stocks. Second, there are some items that are carried as constants in the FofF stock accounts because stock data are not available for them. For both reasons, we work with the flows rather than with the first differences of stocks.

Figures 4.1 to 4.4 present some of the same information in graphical form, plotted against time. Figure 4.3 summarizes the data that underlie the main thrust of this study. It shows that Federal budget deficits have been made more frequent, and larger as a ratio to GNP, since 1961. And it shows, if taken in connection with the initial level of the monetary base (table A.1, line 26), that growth of the monetary base has been made more rapid since 1961 as well.

There are two respects in which the government deficit in the national income accounts, as shown in tables 4.1 and 4.3–4.6, does not give a complete picture. It overstates the real value of the deficit during inflation in that it does not recognize the capital gain to the government that comes from the erosion of the real value of the government's monetary liabilities (securities and the monetary base); see section V.E below for further discussion. On the other hand, the national income accounts deficit understates the true deficit in that it does not provide for the unfunded future liabilities being built up by the social security system.

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Table 4.3

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1945	1946	1947	1948	1949	1950	CODE		
1		3.523	13.384	8.316	-2.638	9.208	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2		-22.108	-102	949	719	-58	324000005	DEPOSITS AT COML. BANKS	2
3		-186	18	-1	-25	59	713068001	F.R. LOANS TO MEMBER BANKS	3
4		20	6.578	2.311	-969	9.369	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5		773	3.721	1.660	185	-1.599	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6		661	1.676	1.936	-4.540	1.259	324100035	- HIGH-POWERED MONEY	6
7		-24.660	-7.110	-6.762	6.786	-1.836	324130035	- U.S. GOVERNMENT DEBT	7
8		-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9		82	6	52	34	-15	715000005	- FINANCIAL N.W., MUN. AUTH.	9
10		1.107	-2.259	-1.377	-268	845	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.3—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1951	1952	1953	1954	1955	1956	CODE		
1	6.508	-3.735	-7.076	-6.034	4.417	6.067	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	651	2.302	-989	-563	-85	-370	324000005	DEPOSITS AT COML. BANKS	2
3	-48	108	-114	-3	97	-82	713068001	F.R. LOANS TO MEMBER BANKS	3
4	7.115	-1.246	1.057	-2.845	4.307	-209	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	145	390	-1.126	-544	-96	953	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	3.840	1.121	558	-1.956	778	686	324100035	- HIGH-POWERED MONEY	6
7	-2.338	4.307	5.435	2.911	-1.048	-5.529	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9	30	44	41	37	32	53	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	177	183	130	-687	-44	985	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.3—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF DOLLARS PER YEAR

	1957	1958	1959	1960	1961	1962	CODE	
1	2.282	-10.271	-1.138	3.035	-3.886	-4.247	316061105	U.S. GOVT. SURPLUS, N.I.A.
2	81	535	762	1.053	14	840	324000005	DEPOSITS AT COML. BANKS
3	25	-4	407	-428	90	-78	713068001	F.R. LOANS TO MEMBER BANKS
4	-996	-1.316	4.421	623	3.150	3.755	324030035	LOANS EXCEPT TO MEMBER BANKS
5	1.126	-2.206	-1.110	-2.018	-674	-1.531	323011095	GOLD, SDR'S & OFF.FGN.EXCH.
6	19	-171	67	-813	1.356	1.487	324100035	- HIGH-POWERED MONEY
7	-1.902	7.244	6.550	-2.668	5.680	5.332	324130035	- U.S. GOVERNMENT DEBT
8	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES
9	69	59	-192	29	67	46	715000005	- FINANCIAL N.W., MON. AUTH.
10	232	-148	807	353	637	-368	317005005	N.I.A.-F.O.F. DISCREPANCY

ANNUAL FLOWS, 1946-79

BILLIONS OF DOLLARS PER YEAR

Table 4.3—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1963	1964	1965	1966	1967	1968	CODE		
1	256	-3.269	530	-1.789	-13.180	-5.824	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-659	239	-1.264	-280	165	-510	324000005	DEPOSITS AT COML. BANKS	2
3	-6	125	-60	77	-32	47	713068001	F.R. LOANS TO MEMBER BANKS	3
4	3.945	3.085	4.396	5.569	602	7.732	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-301	-224	-1.154	-772	-43	799	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	1.947	2.728	2.840	3.954	3.802	4.562	324100035	- HIGH-POWERED MONEY	6
7	723	2.947	-1.806	506	8.886	10.881	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	1.330	105030003	- MINERAL RIGHTS SALES	8
9	55	-467	26	18	28	21	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	2	-1.286	-328	-1.905	-1.156	2.902	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.3—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1969	1970	1971	1972	1973	1974	CODE		
1	8.541	-12.136	-21.959	-17.263	-6.711	-10.721	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	415	3.086	2.470	215	-1.516	-4.939	324000005	DEPOSITS AT COML. BANKS	2
3	-5	152	-296	1.942	-723	-959	713068001	F.R. LOANS TO MEMBER BANKS	3
4	773	657	3.738	625	5.241	16.090	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	1.354	-3.313	-3.184	-646	-140	1.211	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	3.149	5.273	7.524	3.396	7.394	6.029	324100035	- HIGH-POWERED MONEY	6
7	-8.226	7.325	16.936	15.041	454	8.426	324130035	- U.S. GOVERNMENT DEBT	7
8	44	329	717	912	3.168	6.490	105030003	- MINERAL RIGHTS SALES	8
9	40	21	-60	101	132	130	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	1.011	230	430	51	1.575	-1.049	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.3—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1975	1976	1977	1978	1979	1948-60	CODE		
1	-70.584	-53.595	-46.331	-27.685	-11.450	8.941	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-1.479	1.062	2.981	7.158	490	4.987	324000005	DEPOSITS AT COML. BANKS	2
3	-70	-204	240	907	282	-9	713068001	F.R. LOANS TO MEMBER BANKS	3
4	16.709	15.416	12.826	29.979	30.400	21.622	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	593	2.366	271	-1.044	-578	-4.240	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	7.013	6.276	11.806	15.187	9.524	3.184	324100035	- HIGH-POWERED MONEY	6
7	78.264	65.387	51.689	48.560	30.320	11.150	324130035	- U.S. GOVERNMENT DEBT	7
8	1.323	3.973	2.470	1.973	4.745	-	105030003	- MINERAL RIGHTS SALES	8
9	236	48	223	680	390	273	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	499	3.449	3.539	1.715	2.935	1.188	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.3—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1961-65	1966-74	1975-79	1966-79	1948-79	CODE		
1	-10.616	-81.042	-209.645	-290.687	-292.362	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-830	-894	10.212	9.318	13.475	324000005	DEPOSITS AT COML. BANKS	2
3	71	203	1.155	1.358	1.420	713068001	F.R. LOANS TO MEMBER BANKS	3
4	18.331	41.027	105.330	146.357	186.310	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-3.884	-4.734	1.608	-3.126	-11.250	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	10.358	45.083	49.806	94.889	108.431	324100035	- HIGH-POWERED MONEY	6
7	12.876	60.229	274.220	334.449	358.475	324130035	- U.S. GOVERNMENT DEBT	7
8	-	12.990	14.484	27.474	27.474	105030003	- MINERAL RIGHTS SALES	8
9	-273	431	1.577	2.008	2.008	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-1.343	2.089	12.137	14.226	14.071	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.4

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF 1972 DOLLARS PER YEAR

BILLIONS OF 1972 DOLLARS PER YEAR

	1945	1946	1947	1948	1949	1950	CODE		
1		8.015	26.929	15.652	-5.016	17.166	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2		-50.302	-205	1.786	1.367	-108	324000005	DEPOSITS AT COML. BANKS	2
3		-423	36	-1	-47	109	713068001	F.R. LOANS TO MEMBER BANKS	3
4		45	13.235	4.349	-1.842	17.466	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5		1.758	7.486	3.124	351	-2.980	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6		1.503	3.372	3.643	-8.632	2.347	324100035	- HIGH-POWERED MONEY	6
7		-56.109	-14.305	-12.727	12.903	-3.422	324130035	- U.S. GOVERNMENT DEBT	7
8		-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9		186	12	97	64	-27	715000005	- FINANCIAL N.W., MON. AUTH.	9
10		2.518	-4.545	-2.591	-509	1.575	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.4—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF 1972 DOLLARS PER YEAR

BILLIONS OF 1972 DOLLARS PER YEAR

	1951	1952	1953	1954	1955	1956	CODE		
1	11.363	-6.439	-12.017	-10.108	7.243	9.645	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	1.136	3.968	-1.679	-943	-139	-588	324000005	DEPOSITS AT COML. BANKS	2
3	-83	186	-193	-5	159	-130	713068001	F.R. LOANS TO MEMBER BANKS	3
4	12.423	-2.148	1.795	-4.766	7.062	-332	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	253	672	-1.912	-911	-157	1.515	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	6.705	1.932	947	-2.606	1.275	1.090	324100035	- HIGH-POWERED MONEY	6
7	-4.082	7.425	9.230	4.876	-1.718	-8.790	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9	52	75	69	61	52	84	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	309	315	220	-1.150	-72	1.565	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.4—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF 1972 DOLLARS PER YEAR

BILLIONS OF 1972 DOLLARS PER YEAR

	1957	1958	1959	1960	1961	1962	CODE		
1	3.509	-15.547	-1.685	4.419	-5.609	-6.019	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	124	809	1.128	1.533	20	1.190	324000005	DEPOSITS AT COML. BANKS	2
3	38	-6	602	-623	129	-110	713068001	F.R. LOANS TO MEMBER BANKS	3
4	-1.531	-1.992	6.547	907	4.546	5.322	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	1.731	-3.339	-1.643	-2.938	-972	-2.170	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	29	-258	99	-1.183	1.957	2.107	324100035	- HIGH-POWERED MONEY	6
7	-2.925	10.965	9.700	-3.885	8.198	7.557	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9	106	89	-284	42	96	65	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	356	-224	1.195	514	919	-521	317005005	N.I.A.-F.O.F. DISCREPANCY	10

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF 1972 DOLLARS PER YEAR

BILLIONS OF 1972 DOLLARS PER YEAR

	1963	1964	1965	1966	1967	1968	CODE		
1	357	-4.495	713	-2.330	-16.679	-7.053	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-920	328	-1.700	-364	208	-617	324000005	DEPOSITS AT COML. BANKS	2
3	-8	171	-80	100	-40	56	713068001	F.R. LOANS TO MEMBER BANKS	3
4	5.510	4.242	5.914	7.255	761	9.364	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-420	-308	-1.552	-1.005	-54	967	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	2.719	3.751	3.821	5.151	4.811	5.525	324100035	- HIGH-POWERED MONEY	6
7	1.009	4.053	-2.430	659	11.245	13.177	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	1.610	105030003	- MINERAL RIGHTS SALES	8
9	76	-642	34	23	35	25	715000005	- FINANCIAL N.W. MON. AUTH.	9
10	2	-1.768	-441	-2.481	-1.462	3.514	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.4—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF 1972 DOLLARS PER YEAR

BILLIONS OF 1972 DOLLARS PER YEAR

	1969	1970	1971	1972	1973	1974	CODE		
1	9.848	-13.283	-22.869	-17.262	-6.343	-9.240	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	478	3.377	2.572	215	-1.432	-4.257	324000005	DEPOSITS AT COML. BANKS	2
3	-5	166	-308	1.942	-683	-826	713068001	F.R. LOANS TO MEMBER BANKS	3
4	891	719	3.892	625	4.953	13.868	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	1.561	-3.626	-3.315	-646	-132	1.043	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	3.631	5.771	7.835	3.395	6.988	5.196	324100035	- HIGH-POWERED MONEY	6
7	-9.485	8.017	17.637	15.040	429	7.262	324130035	- U.S. GOVERNMENT DEBT	7
8	50	360	746	912	2.994	5.593	105030003	- MINERAL RIGHTS SALES	8
9	46	22	-62	101	124	112	715060005	- FINANCIAL N.W., MON. AUTH.	9
10	1.165	251	447	51	1.488	-904	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.4—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF 1972 DOLLARS PER YEAR

BILLIONS OF 1972 DOLLARS PER YEAR

	1975	1976	1977	1978	1979	1948-60	CODE		
1	-55.512	-40.082	-32.696	-18.207	-6.920	18.185	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-1.163	794	2.103	4.707	296	8.394	324000005	DEPOSITS AT COML. BANKS	2
3	-55	-152	169	596	170	6	713068001	F.R. LOANS TO MEMBER BANKS	3
4	13.141	11.529	9.051	19.716	18.373	37.938	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	466	1.769	191	-686	-349	-6.234	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	5.515	4.693	8.331	9.988	5.756	5.388	324100035	- HIGH-POWERED MONEY	6
7	61.552	48.902	36.477	31.936	18.324	17.550	324130035	- U.S. GOVERNMENT DEBT	7
8	1.640	2.971	1.743	1.297	2.867	-	105030003	- MINERAL RIGHTS SALES	8
9	135	35	157	447	235	480	715000005	- FINANCIAL N.W. MON. AUTH.	9
10	392	2.579	2.497	1.127	1.773	1.503	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.4—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

BILLIONS OF 1972 DOLLARS PER YEAR

BILLIONS OF 1972 DOLLARS PER YEAR

	1961-65	1966-74	1975-79	1966-79	1948-79	CODE		
1	-15.053	-85.211	-153.417	-238.628	-235.496	3160611105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-1.082	180	6.737	6.917	14.229	324000005	DEPOSITS AT COML. BANKS	2
3	142	402	728	1.130	1.238	713068001	F.R. LOANS TO MEMBER BANKS	3
4	25.534	42.328	71.810	114.138	177.610	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-5.422	-5.207	1.391	-3.816	-15.472	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	14.355	48.303	34.283	82.586	102.329	324100035	- HIGH-POWERED MONEY	6
7	18.387	63.981	197.191	261.172	297.109	324130035	- U.S. GOVERNMENT DEBT	7
8	-	12.265	9.918	22.183	22.183	105030003	- MINERAL RIGHTS SALES	8
9	-371	426	1.059	1.485	1.594	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-1.809	2.069	8.368	10.437	10.131	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.5

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO GROSS NATIONAL PRODUCT

RATIOS TO GROSS NATIONAL PRODUCT

	1945	1946	1947	1948	1949	1950	CODE		
1		1.680	5.749	3.209	-1.021	3.217	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2		-10.548	-43	365	278	-19	324000005	DEPOSITS AT COML. BANKS	2
3		-88	7	-	-9	20	713068001	F.R. LOANS TO MEMBER BANKS	3
4		9	2.825	891	-375	3.273	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5		368	1.598	640	71	-558	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6		314	719	746	-1.759	439	324100035	- HIGH-POWERED MONEY	6
7		-11.765	-3.054	-2.609	2.629	-641	324130035	- U.S. GOVERNMENT DEBT	7
8		-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9		38	2	19	12	-4	715000005	- FINANCIAL N.W., MON. AUTH.	9
10		527	-970	-530	-103	294	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.5—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO GROSS NATIONAL PRODUCT

	1951	1952	1953	1954	1955	1956	CODE		
1	1.970	-1.075	-1.932	-1.646	1.105	1.441	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	196	662	-269	-153	-20	-87	324000005	DEPOSITS AT COML. BANKS	2
3	-14	30	-30	-	23	-18	713068001	F.R. LOANS TO MEMBER BANKS	3
4	2.154	-358	288	-776	1.078	-49	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	43	111	-307	-148	-23	226	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	1.162	322	151	-424	194	162	324100035	- HIGH-POWERED MONEY	6
7	-707	1.240	1.483	794	-261	-1.313	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9	8	12	10	9	7	12	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	53	52	35	-187	-10	233	317005005	N.I.A.-F.O.F. DISCREPANCY	10

ANNUAL FLOWS, 1946-79

RATIOS TO GROSS NATIONAL PRODUCT

Table 4.5—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO GROSS NATIONAL PRODUCT

RATIOS TO GROSS NATIONAL PRODUCT

	1957	1958	1959	1960	1961	1962	CODE		
1	514	-2.287	-233	599	-742	-752	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	17	118	156	207	2	148	324000005	DEPOSITS AT COML. BANKS	2
3	5	-	83	-84	16	-13	713068001	F.R. LOANS TO MEMBER BANKS	3
4	-224	-292	908	122	601	665	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	253	-490	-227	-398	-128	-271	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	3	-37	13	-160	258	263	324100035	- HIGH-POWERED MONEY	6
7	-429	1.613	1.345	-526	1.084	945	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9	15	12	-38	5	12	7	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	51	-32	165	69	121	-64	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.5—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO GROSS NATIONAL PRODUCT

RATIOS TO GROSS NATIONAL PRODUCT

	1963	1964	1965	1966	1967	1968	CODE		
1	42	-513	76	-237	-1.654	-670	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-110	37	-183	-36	20	-58	324000005	DEPOSITS AT COML. BANKS	2
3	-	19	-8	9	-3	4	713068001	F.R. LOANS TO MEMBER BANKS	3
4	662	484	638	739	75	889	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-50	-34	-167	-102	-4	91	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	326	428	412	524	476	524	324100035	- HIGH-POWERED MONEY	6
7	121	463	-261	66	1.115	1.252	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	152	105030003	- MINERAL RIGHTS SALES	8
9	8	-72	3	1	3	1	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-	-201	-47	-252	-144	333	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.5—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO GROSS NATIONAL PRODUCT

RATIOS TO GROSS NATIONAL PRODUCT

	1969	1970	1971	1972	1973	1974	CODE		
1	912	-1.234	-2.064	-1.473	-513	-758	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	43	313	231	17	-115	-349	324000005	DEPOSITS AT COML. BANKS	2
3	-	14	-27	165	-54	-67	713068001	F.R. LOANS TO MEMBER BANKS	3
4	82	66	351	52	400	1.138	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	144	-336	-298	-54	-10	85	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	336	536	707	289	565	426	324100035	- HIGH-POWERED MONEY	6
7	-878	745	1.592	1.283	34	595	324130035	- U.S. GOVERNMENT DEBT	7
8	4	32	66	77	241	458	105030003	- MINERAL RIGHTS SALES	8
9	3	1	-5	8	9	8	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	107	22	39	3	120	-73	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.5—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO GROSS NATIONAL PRODUCT

RATIOS TO GROSS NATIONAL PRODUCT

	1975	1976	1977	1978	1979	AVERAGE 1948-60	CODE		
1	-4.616	-3.148	-2.438	-1.300	-482	297	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-96	61	156	335	20	111	324000005	DEPOSITS AT COML. BANKS	2
3	-4	-11	12	42	11	-	713068001	F.R. LOANS TO MEMBER BANKS	3
4	1.092	905	674	1.408	1.282	510	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	38	138	13	-48	-23	-62	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	458	368	621	713	401	62	324100035	- HIGH-POWERED MONEY	6
7	5.118	3.840	2.720	2.281	1.279	201	324130035	- U.S. GOVERNMENT DEBT	7
8	86	232	129	92	199	-	105030003	- MINERAL RIGHTS SALES	8
9	14	2	11	31	15	6	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	32	202	185	80	123	7	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.5—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

	AVERAGE RATIOS TO GROSS NATIONAL PRODUCT						AVERAGE RATIOS TO GROSS NATIONAL PRODUCT	
	1961-65	1966-74	1975-79	1966-79	1948-79	CODE		
1	-377	-855	-2.397	-1.406	-553	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-20	7	95	38	59	324000005	DEPOSITS AT COML. BANKS	2
3	2	4	10	6	3	713068001	F.R. LOANS TO MEMBER BANKS	3
4	610	422	1.073	654	589	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-130	-54	23	-26	-57	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	338	487	513	496	295	324100035	- HIGH-POWERED MONEY	6
7	470	645	3.048	1.503	813	324130035	- U.S. GOVERNMENT DEBT	7
8	-	115	148	127	55	105030003	- MINERAL RIGHTS SALES	8
9	-7	3	15	8	5	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-38	17	125	56	21	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.6

11 JUNE 1980

ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

	1945	1946	1947	1948	1949	1950	CODE		
1		-1.589	-6.451	-4.182	1.303	-4.718	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2		9.974	48	-476	-354	29	324000005	DEPOSITS AT COML. BANKS	2
3		83	-8	-	11	-29	713068001	F.R. LOANS TO MEMBER BANKS	3
4		-8	-3.170	-1.162	478	-4.801	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5		-348	-1.793	-834	-90	819	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6		-297	-807	-973	2.243	-644	324100035	- HIGH-POWERED MONEY	6
7		11.125	3.427	3.401	-3.352	940	324130035	- U.S. GOVERNMENT DEBT	7
8		-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9		-36	-2	-25	-16	7	715000005	- FINANCIAL N.W., MON. AUTH.	9
10		-498	1.088	692	131	-432	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.6—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

	1951	1952	1953	1954	1955	1956	CODE		
1	-3.430	1.919	3.520	2.922	-2.177	-3.055	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-342	-1.182	491	272	41	185	324000005	DEPOSITS AT COML. BANKS	2
3	24	-55	56	-	-47	40	713068001	F.R. LOANS TO MEMBER BANKS	3
4	-3.750	640	-525	1.377	-2.123	104	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-75	-199	559	263	46	-479	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	-2.024	-575	-277	753	-383	-345	324100035	- HIGH-POWERED MONEY	6
7	1.232	-2.213	-2.703	-1.409	516	2.784	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9	-15	-22	-19	-17	-15	-26	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-92	-93	-64	332	21	-495	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.6—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

	1957	1958	1959	1960	1961	1962	CODE		
1	-1.157	4.932	538	-1.449	1.806	1.933	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-40	-256	-360	-502	-6	-381	324000005	DEPOSITS AT COML. BANKS	2
3	-12	1	-192	203	-41	35	713068001	F.R. LOANS TO MEMBER BANKS	3
4	504	631	-2.092	-297	-1.464	-1.709	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-570	1.059	524	963	312	696	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	-9	81	-31	387	-630	-676	324100035	- HIGH-POWERED MONEY	6
7	964	-3.479	-3.099	1.273	-2.641	-2.427	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	8
9	-34	-27	90	-13	-30	-20	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-117	70	-381	-168	-295	167	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.6—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

	1963	1964	1965	1966	1967	1968	CODE		
1	-115	1.454	-234	782	5.451	2.326	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	297	-105	559	121	-67	243	324000005	DEPOSITS AT COML. BANKS	2
3	2	-55	26	-33	12	-18	713068001	F.R. LOANS TO MEMBER BANKS	3
4	-1.783	-1.372	-1.947	-2.435	-248	-3.088	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	135	99	510	337	17	-318	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	-880	-1.213	-1.258	-1.729	-1.572	-1.822	324100035	- HIGH-POWERED MONEY	6
7	-326	-1.310	799	-220	-3.675	-4.347	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-	-	-	-	-530	105030003	- MINERAL RIGHTS SALES	8
9	-24	207	-11	-7	-11	-7	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-	571	144	832	477	-1.159	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.6—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

	1969	1970	1971	1972	1973	1974	CODE		
1	-3.494	4.720	7.825	5.792	2.206	3.404	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	-169	-1.200	-879	-71	498	1.568	324000005	DEPOSITS AT COML. BANKS	2
3	1	-58	104	-651	237	304	713068001	F.R. LOANS TO MEMBER BANKS	3
4	-315	-255	-1.331	-209	-1.723	-5.110	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-553	1.288	1.134	216	45	-384	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	-1.288	-2.050	-2.680	-1.139	-2.431	-1.914	324100035	- HIGH-POWERED MONEY	6
7	3.365	-2.849	-6.034	-5.046	-148	-2.675	324130035	- U.S. GOVERNMENT DEBT	7
8	-17	-127	-255	-305	-1.041	-2.060	105030003	- MINERAL RIGHTS SALES	8
9	-15	-7	20	-33	-42	-40	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-413	-88	-152	-16	-517	332	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.6—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

RATIOS TO FINANCIAL N.W., U.S.G. & M.A.

	1975	1976	1977	1978	1979	AVERAGE 1948-60	CODE		
1	18.157	12.028	9.275	5.184	2.073	-387	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	379	-237	-596	-1.340	-88	-192	324000005	DEPOSITS AT COML. BANKS	2
3	17	45	-47	-169	-50	-	713068001	F.R. LOANS TO MEMBER BANKS	3
4	-4.297	-3.459	-2.567	-5.614	-5.505	-847	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	-152	-530	-53	195	104	152	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	-1.803	-1.408	-2.363	-2.843	-1.724	-138	324100035	- HIGH-POWERED MONEY	6
7	-20.133	-14.675	-10.348	-9.094	-5.491	-395	324130035	- U.S. GOVERNMENT DEBT	7
8	-339	-891	-494	-369	-858	-	105030003	- MINERAL RIGHTS SALES	8
9	-60	-10	-44	-126	-70	-10	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	-127	-773	-708	-320	-531	-46	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Table 4.6—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS

	AVG. RATIOS TO FINAN. N.W., U.S.G.&M.A.						AVG. RATIOS TO FINAN. N.W., U.S.G.&M.A.	
	1961-65	1966-74	1975-79	1966-79	1948-79	CODE		
1	968	3.224	9.344	5.410	2.360	316061105	U.S. GOVT. SURPLUS, N.I.A.	1
2	72	-	-376	-134	-125	324000065	DEPOSITS AT COML. BANKS	2
3	-6	-11	-40	-21	-10	713068001	F.R. LOANS TO MEMBER BANKS	3
4	-1.655	-1.635	-4.289	-2.583	-1.733	324030035	LOANS EXCEPT TO MEMBER BANKS	4
5	351	198	-87	96	159	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	5
6	-932	-1.848	-2.029	-1.912	-1.038	324100035	- HIGH-POWERED MONEY	6
7	-1.181	-2.403	-11.949	-5.812	-2.888	324130035	- U.S. GOVERNMENT DEBT	7
8	-	-482	-591	-521	-228	105030003	- MINERAL RIGHTS SALES	8
9	23	-16	-62	-33	-15	715000005	- FINANCIAL N.W., MON. AUTH.	9
10	117	-78	-492	-226	-99	317005005	N.I.A.-F.O.F. DISCREPANCY	10

Figure 4.1

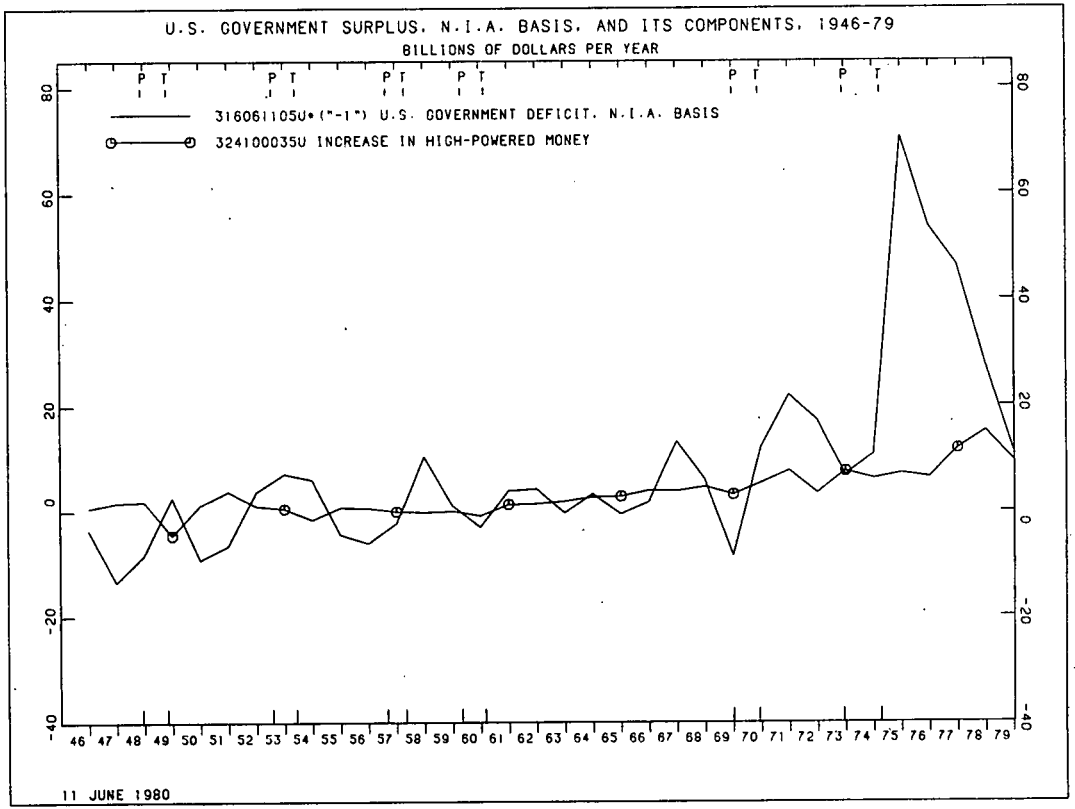

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS, 1946-79
BILLIONS OF DOLLARS PER YEAR
P T
316061105U*("-1") U.S. GOVERNMENT DEFICIT, N.I.A. BASIS
324100035U INCREASE IN HIGH-POWERED MONEY
80
60
40
20
0
-20
-40
46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
11 JUNE 1980

Figure 4.2

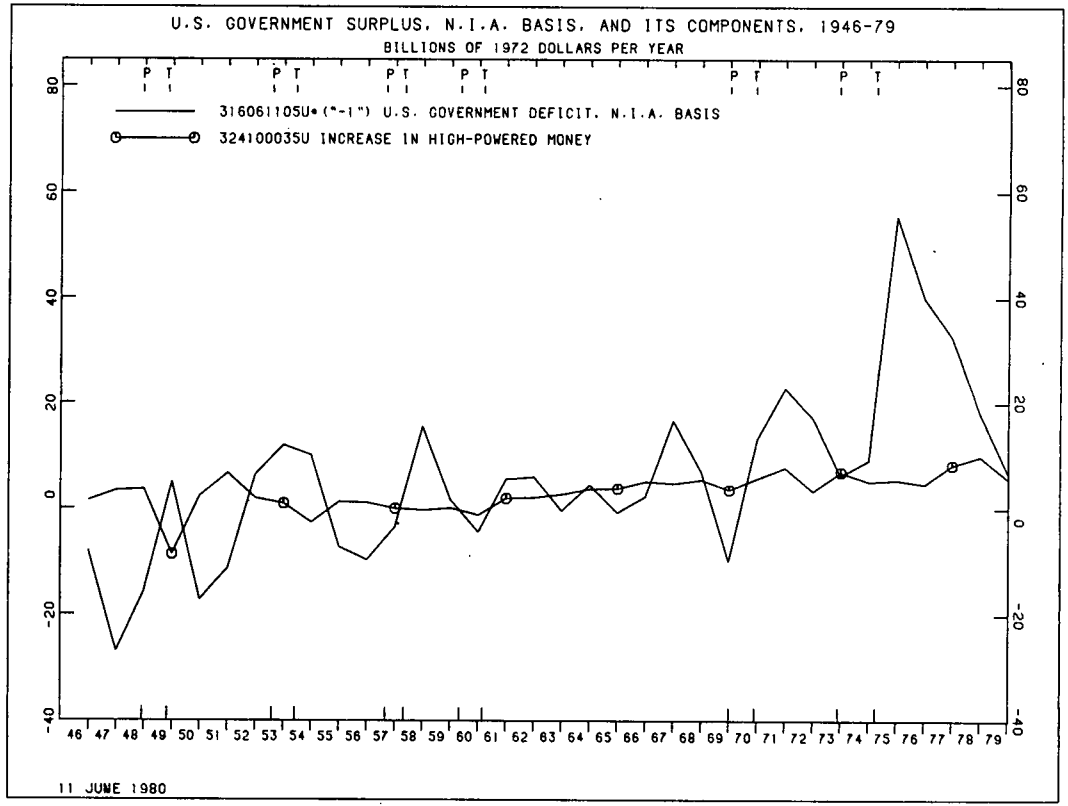
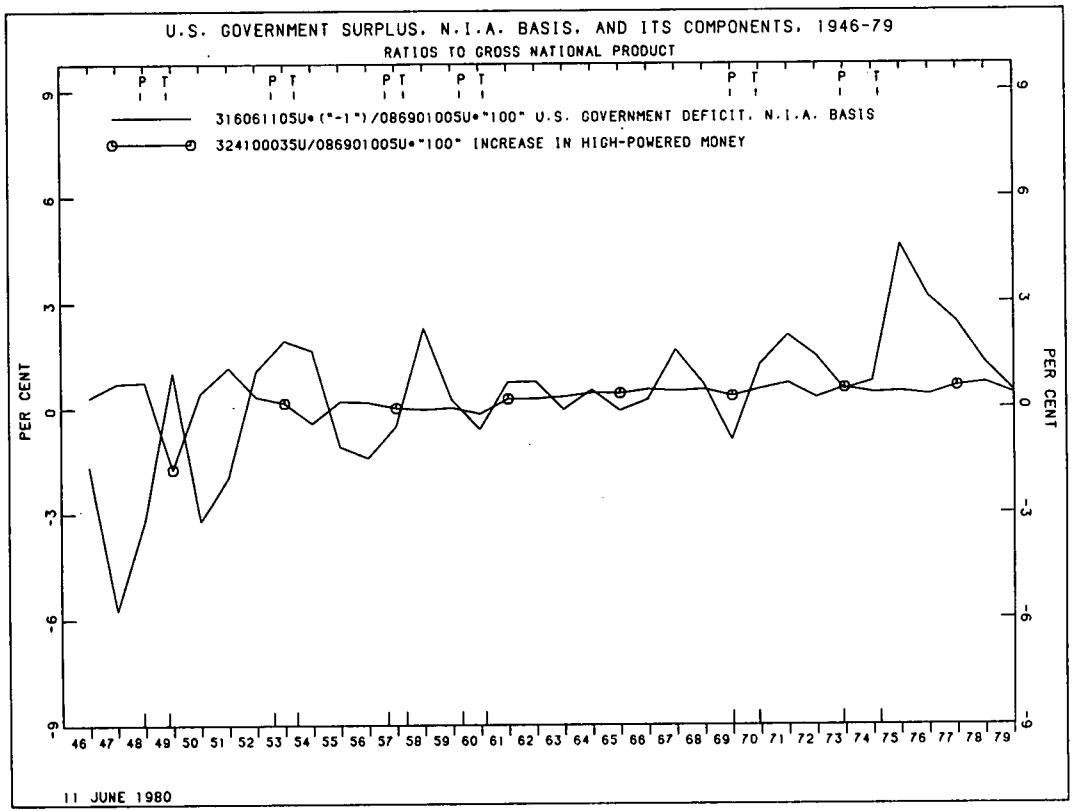
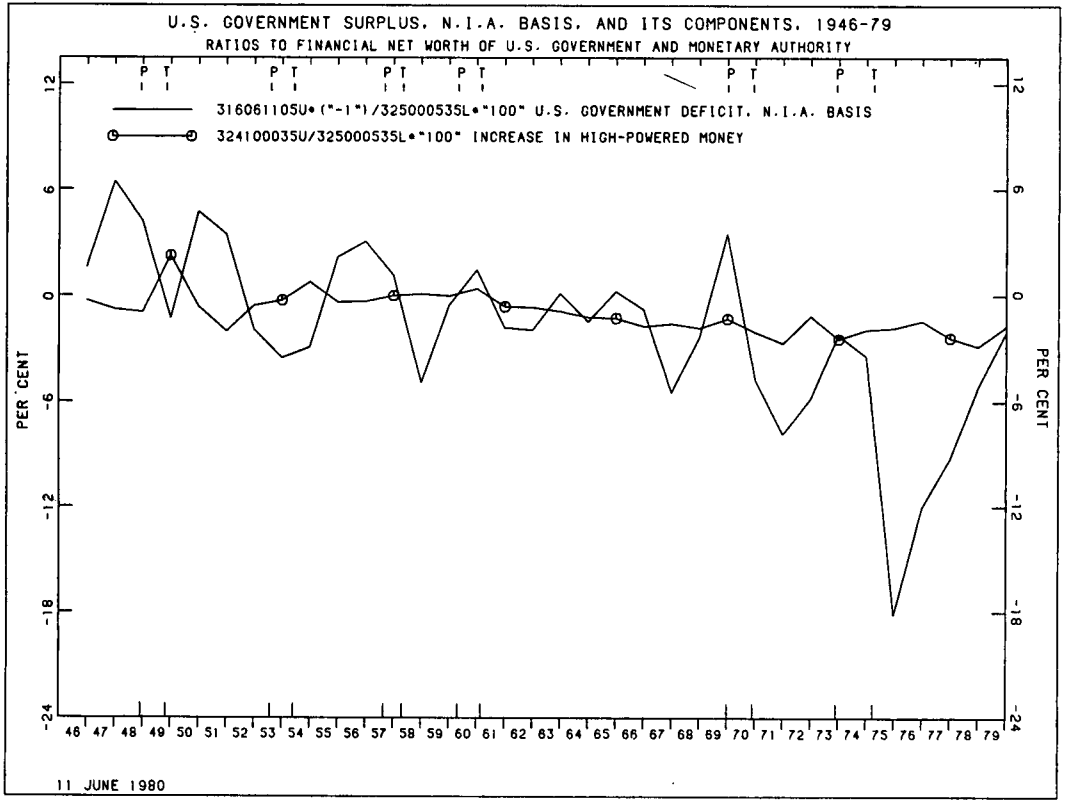

U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS, 1946-79
BILLIONS OF 1972 DOLLARS PER YEAR
P T
316061105U*(*-1*) U.S. GOVERNMENT DEFICIT, N.I.A. BASIS
324100035U INCREASE IN HIGH-POWERED MONEY
80
60
40
20
0
-20
-40
46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
11 JUNE 1980

Figure 4.3


U.S. GOVERNMENT SURPLUS, N.I.A. BASIS, AND ITS COMPONENTS, 1946-79
RATIOS TO GROSS NATIONAL PRODUCT
P T
316061105U*("-1")/086901005U*"100" U.S. GOVERNMENT DEFICIT, N.I.A. BASIS
324100035U/086901005U*"100" INCREASE IN HIGH-POWERED MONEY
PER CENT
9
6
3
0
-3
-6
-9
46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
11 JUNE 1980

56-369 O - 81 - 10

Figure 4.4



V. Macroeconomic Effects of Federal Debt Financing

A. Introduction

In this section we discuss the relations of Federal debt financing to inflation, employment, the money stocks, interest rates, the exchange rate, and the balance of payments, with special reference to experience since World War II. Its main results are summarized in section I above.

B. The Relation Between Inflation and the Several Concepts of the Stock of Money

So far we have emphasized only one of the several concepts of the stock of money; namely, the monetary base (high powered money). Its definition and data as used in this study are found in table A.1, lines 26–29. There are several other concepts that have important uses, and that behave somewhat differently than does the monetary base. Also, so far we have not discussed the variation that exists in the relation between the growth rate of the monetary base and the rate of inflation. In this subsection we address these matters.

We will consider briefly four additional recently adopted concepts of the stock of money, known as M1A, M1B, M2, and M3. (The formerly used concepts were called M_1, M_2, and M_3.) M1A is the sum of currency outside banks plus commercial bank demand deposits adjusted, excluding U.S. Government deposits, interbank deposits, and deposits held by foreign banks and official institutions. M1A is almost the same as old M_1. M1B is M1A plus checkable deposits at all depositary institutions. It includes NOW accounts and automatic funds transfer service accounts at banks and thrift institutions, demand deposits at mutual savings banks, and credit union share draft accounts. M2 is M1B plus savings and small-denomination time deposits at all depositary institutions, overnight repurchase agreements at commercial banks, overnight Eurodollars held by U.S. residents other than banks at Caribbean branches of member banks, and money market mutual fund shares. M3 is M2 plus large-denomination time deposits at all depositary institutions and term repurchase agreements at commercial banks and savings and loan associations.[7]

Obviously, M3 exceeds M2, which exceeds M1B, which exceeds M1A. Less obviously, M1A exceeds the monetary base. Why? The ratio of M1A to the monetary base is the ratio of (currency outside banks + demand deposits) divided by (currency outside banks plus bank reserves). And demand deposits exceed bank reserves (roughly by the amount of interest-earning assets that banks hold). Therefore M1A exceeds the monetary base. One can think of each dollar of reserves as supporting more than a dollar of deposits. (That is why the names "monetary base" and "high powered money" make sense.)

The ratios of these four M's to each other and to the monetary base can and do change through time, in response to demand and supply conditions in the financial markets, and to government regulation of interest rates, of bank reserve ratios, and so on. These changes are

[7] Data for these money stocks are published by the Federal Reserve. See the *Federal Reserve Bulletin* for February, 1980 for a description of the new concepts of M1A, M1B, M2, and M3 and their relationships to old M_1, M_2, and M_3. See the *Federal Reserve Bulletin* for April 1980 and Board of Governors [1980] for data for the new concepts since 1959.

usually gradual except when government regulation is involved. For example, if there is a ceiling on the interest rate payable on one kind of deposit, and the market rate rises to that ceiling and would rise further if allowed to, then depositors will rather abruptly switch to other forms of deposit whose interest rates are not regulated, even if financial institutions have to invent such forms of deposit (which they often do: witness the invention of the certificate of deposit and the money market mutual fund). Or if the Federal Reserve abruptly increases the required reserve ratios of banks, other things equal, then banks must reduce the amount of loans outstanding, thus reducing M1A. In a severe recession or depression, M1A can decline substantially more than the monetary base, as bank deposits and loans decline. Indeed, in the 1929–33 depression, old M_1 declined drastically but the base did not decline.

The *adjusted monetary base* is the monetary base plus an adjustment (sometimes negative) to allow for the effects of changes in required reserve ratios against deposits and for changes in the distribution of deposits among accounts that have different required ratios. The advantage of the adjusted monetary base is that it is a single time series that reflects monetary policy actions to increase or decrease M1A regardless of whether these changes come from changes in the (unadjusted) monetary base or from changes in required reserve ratios. Data for the adjusted monetary base are published by the Federal Reserve Bank of St. Louis.

Because the stocks of money, differently defined, can change relative to each other, their growth rates need not be identical (and usually they are not). Of course this raises the question as to which money stock, if any, should be used as a guide for monetary policy. We will return to this question presently.

But first we consider the relation between inflation and the growth rates of the various stocks of money. A useful identity for this purpose is the so-called equation of exchange. It says that nominal GNP can be expressed in two equivalent ways, thus:

nominal GNP equals real GNP times price level equals money stock times velocity of circulation of money (5.1)

This equation defines the velocity of circulation of money, which is not directly observable, in terms of variables that are directly observable. Of course, for every definition of the money stock, there is a corresponding money velocity given by the ratio of nominal GNP to that money stock.

The velocity of money varies through the years, no matter which definition of the money stock one chooses. It varies more for some definitions than others but it is not constant for any of them. However, it does not vary rapidly or unsystematically. It rises when the use of money becomes more expensive, as when interest rates are high and/or when inflation is rapid, because people find it worthwhile to reduce their average real holdings of money, thus increasing its velocity. It falls when incomes rise, because people feel they can afford the convenience that comes from holding larger stocks of money per unit of income, thus decreasing its velocity.

Return to equation (5.1), and consider the growth rate of nominal GNP. The growth rate of a product of two variables is approximately equal to the sum of the growth rates of the two. Therefore we see from (5.1) that, approximately,

Growth rate of nominal GNP equals growth rate of real GNP plus inflation rate equals growth rate of money stock plus growth rate of velocity of money (5. 2)

This too is true for each definition of the money stock that one may choose.

Now let us look at the data for the growth rates that appear in equation (5.2). They are calculated in table 5.1 for the three periods 1960 to 1965 (5 years), 1965 to 1979 (14 years), and 1960 to 1979 (19 years).

TABLE 5.1.—SEVERAL MONEY STOCKS (NOT SEASONALLY ADJUSTED) AND THEIR VELOCITIES OF CIRCULATION WITH GROWTH RATES FOR 1960 THROUGH 1979

Money stock or other variable	Levels			Average annual growth rates, percent			Velocity of money					
							Levels			Average annual growth rates, percent		
	1960	1965	1979	1960 to 1965	1965 to 1979	1960 to 1979	1960	1965	1979	1960 to 1965	1965 to 1979	1960 to 1979
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Nominal GNP	506.0	688.0	2,369.0	6.3	9.2	8.5						
Real GNP	737.0	926.0	1,432.0	4.7	3.2	3.6						
GNP deflator	68.7	74.3	165.5	1.6	5.9	4.7						
Monetary base	50.0	60.5	155.4	3.9	7.0	6.2	10.1	11.4	15.2	2.5	2.1	2.2
Adjusted monetary base	44.4	57.5	154.0	5.3	7.3	6.8	11.4	12.0	15.4	1.0	1.8	1.6
M1A	145.3	173.7	381.1	3.6	5.8	5.2	3.48	3.96	6.22	2.6	3.3	3.1
M1B	145.3	173.7	397.3	3.6	6.1	5.4	3.48	3.96	5.96	2.6	3.0	2.9
M2	314.2	461.5	1,526.0	8.0	8.9	8.7	1.61	1.49	1.55	−1.5	.3	−.2
M3	316.1	482.1	1,779.0	8.8	9.8	9.5	1.60	1.43	1.33	−2.2	−.5	−1.0

Sources:

Nominal GNP (billion dollars per year), real GNP (billions of 1972 dollars per year), and GNP deflator (1972: 100): national income accounts.

Monetary base, year-end (billions of dollars): Table A.2.

Adjusted monetary base, December (billions of dollars): Federal Reserve Bank of St. Louis, "Review" and "Monetary Trends."

M1A, M1B, M2, M3, December (billions of dollars): Board of Governors [1980] and "Federal Reserve Bulletin", April 1980.

Velocities: Calculated as nominal GNP for the year divided by the December money stock.

Growth rates: For nominal and real GNP and the GNP deflator, growth rates are computed from each year's average. For stocks, growth rates are computed from each year's December figure. For velocities, growth rates are computed from each year's velocity ratio.

All six money stocks were allowed to grow too fast for price-level stability since the end of 1960, and especially since the end of 1965. From then until the end of 1979 each of their average rates was between 5.8 and 9.8 percent, substantially too high.

None of the six velocities was constant during any of the three periods, though the velocity of M2 was nearly constant. But notice that none of the velocities changed very rapidly over any of the three periods: The largest change was for M1A's velocity, which grew from 1965 to 1979 at an average rate of 3.3 percent a year. This modest growth of M1A's velocity together with the nearly constant velocity of M2 and the slight decline in M3's velocity are attributable to the fact that during these periods nominal interest rates were rising on all the components of M2 and M3 except the M1A component, which has had a legal interest ceiling of zero; people were gradually shifting their holdings out of currency and demand deposits (especially the latter) into interest-paying deposits and savings shares. These changes in velocity are not only gradual and roughly predictable; they also reinforce rather than counteract the effects of changes in the growth rates of the money stocks. Increases in monetary growth rates create more inflation, which increases interest rates and velocities and thus compounds the inflationary effect as shown by equation (5.2). Similarly, decreases in monetary growth rates dampen inflation, which lowers interest rates and velocities, thus compounding the deflationary effect.

We conclude that although the relation between the inflation rate and the growth rates of the money stocks is not immutable, it changes slowly enough so that it is reliable as an approximate guide to the kind of monetary policy that is required to stop inflation. The message is that the growth rates of *all* the money stocks must be brought down. The Federal Reserve exerts direct control over the monetary base, and must reduce its growth rate substantially if inflation is to be brought to a halt. If there are to be substantial changes in required reserve ratios in the future, the *adjusted* monetary base is the better base to stabilize, since it incorporates reserve requirement changes. If interest ceilings and other regulations combine with changes in the inflation rate to produce rapid shifts of the public's asset holdings among different forms of money, as in the late 1970's, the monetary base may temporarily be a better quantity to stabilize than M1A or M1B or M2. In normal times M2 may be the best choice since it has had a more nearly constant velocity than the others. In the remainder of this paper we will conduct the discussion mainly in terms of the monetary base.

Variations in velocity are not likely to be abrupt in the future, but if velocity does change over long periods, gradual adjustments in the growth rate of the monetary base should be made accordingly. This process cannot easily be made precise in advance, but it can be administered in such a way as to stop inflation and maintain approximate price level stability over long periods in the future.

C. Inflation, Unemployment, and Phillips Curves

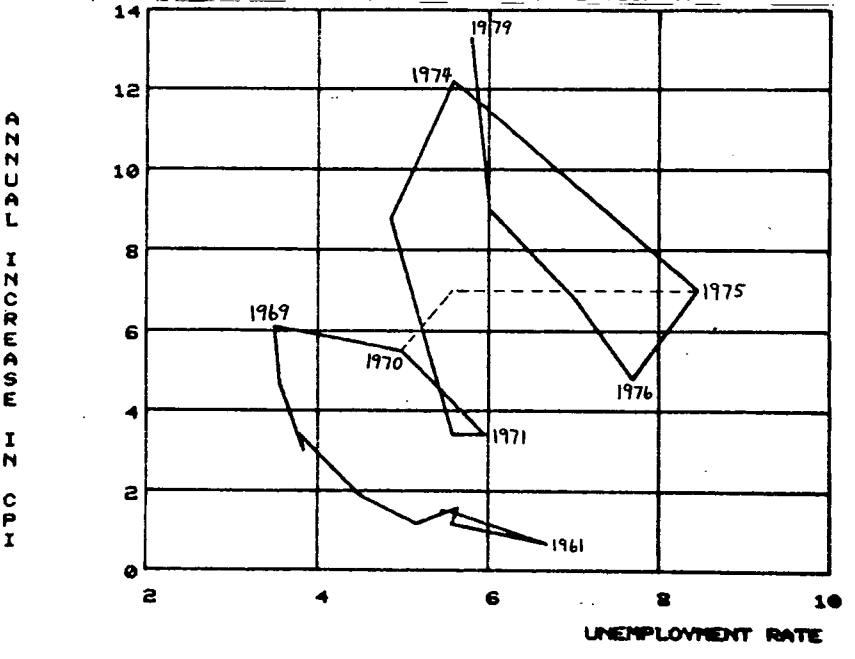
At one time, in the middle and late sixties, it was thought by some that the Phillips curve diagram gave a reliable picture of a stable trade-off between the inflation rate and the unemployment rate. (How-

ever, Phillips himself did not say this. See Lipsey [1978] for a good review.) Subsequent data for many countries combined with further theoretical work have destroyed that view.

It is instructive to look at a Phillips curve diagram for the U.S.; see figure 5.1. For the period from 1959 to 1961, it suggests a stable negative relation between unemployment and inflation, such that by accepting a somewhat higher permanent inflation rate we could attain a permanently lower unemployment rate. If this were true, most people would probably be willing to accept permanent inflation at the moderate rate of say 3 percent in order to achieve a permanent reduction in the unemployment rate to say 4 percent. However, the apparently stable relation fell to pieces as more data became available. Instead of a stable negatively sloping curve, the graph became a series of loops, containing segments with positive, zero, or infinite slopes as well as negative. This happened not only for the U.S. but also for Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, and the United Kingdom: see McCracken *et al.* [1977], pp. 105–6, 314, and 339–41.

A somewhat more complex theory, known as the "natural rate of unemployment" hypothesis, is more nearly (but not completely) consistent with the data. It distinguishes a long-run Phillips curve from a series of short-run curves. It says that the long-run Phillips curve applies to situations where the actual and expected inflation rates are equal, and that this curve is approximately vertical at the so-called natural rate of unemployment which is approximately independent of the inflation rate; though the natural rate can change for other reasons. (See below.) It says further that for each different

FIGURE 5.1
U.S. UNEMPLOYMENT VS. INFLATION 1960-79



expected rate of inflation there is a different negatively sloped short-run Phillips curve which crosses the long-run curve at the expected rate of inflation. It says still further that people change their expectations of inflation slowly, partly in response to recently observed actual rates. Thus it seeks to explain figure 5.1 by supposing that the natural unemployment rate in the U.S. was about 4¾ percent in the 1960's and is about 6¾ percent now, and that inflationary expectations behaved as follows: Were quite steady at a rate of about 1 to 1.5 percent in 1959–67 so that the short-run Phillips curve for those years was quite stable; rose in 1968–70 so that the data for 1968, 1969, and 1970–72 were on new and successively higher short-run Phillips curves; rose again in 1973–74 so that the data for 1974–75 were on a still higher short-run curve; receded somewhat in 1976 so that the data for 1976–78 were on a somewhat lower short-run curve, but not as low as the one for 1970–72; and rose again in 1979. According to this hypothesis, the sections of the diagram where the curve slopes positively or is vertical or horizontal correspond to changes in inflationary expectations, upward for movements up and/or toward the right, and downward for movements down and/or toward the left. (The price data understate the actual inflation rate for 1971–73 because price controls were in effect, and overstate it for 1974 because part of the observed 1974 increase reflects delayed 1971–73 inflation that did not come into the open until controls were lifted in 1974. A point representing the 1971–74 average is shown on the diagram, connected to 1970 and 1975 by dashed lines, as a reminder of this.)

When inflation is expected, the contracts that people make for future payments of money reflect an adjustment for the decline in the purchasing power of the dollar that is expected to occur with the inflation. Nominal interest rates are important cases in point. Long-term interest rates have risen substantially since being set free by the Treasury-Federal Reserve accord of 1951, in a manner broadly consistent with the kind of inflationary expectations that rationalize figure 5.1 via the natural rate hypothesis. See section V.F. below.

D. Inflation, Unemployment, and Federal Debt Financing

Next we look at postwar statistics for the Federal budget deficit and its financing, and their relation to unemployment and inflation, for the period since the beginning of 1948. We choose 1948 as a starting point because it was the first normal peacetime year after the readjustments of prices and production following World War II.

Table 5.2 shows the cumulative Federal deficit and its financing by means of additions to the monetary base, borrowing from the private and foreign sectors, and other sources for the entire period 1948–79 inclusive, and several subperiods. This table corresponds to equation (4.5) which states the U.S. Government budget restraint in terms of the deficit. The source is table 4.3 which states the same relation in terms of the surplus. Budgetary data mentioned in the text of this subsection come from table 5.2 unless otherwise stated.

TABLE 5.2.—CUMULATIVE U.S. GOVERNMENT DEFICIT AND ITS FINANCING FOR 1948 THROUGH 1979 AND SELECTED SUBPERIODS

[Flows in billions of dollars]

	1948–60	1961–65	1966–74	1975–79	1966–79	1948–79
1. U.S. Government deficit, NIA basis	−8.9	10.6	81.0	209.6	209.7	292.4
2.—Treasury deposits at commercial banks	5.0	−.8	−.9	10.2	9.3	13.5
3.—Federal Reserve loans to member banks	−0	.1	.2	1.2	1.4	1.4
4.—U.S. Government loans except to member banks	21.6	18.3	41.0	105.3	146.4	186.3
5.—U.S. gold, SDR and foreign exchange reserves	−4.2	−3.9	−4.7	1.6	−3.1	−11.2
6. Monetary base (high-powered money)	3.2	10.4	45.1	49.8	94.9	108.4
7. U.S. Government debt in private and foreign hands	11.2	12.9	60.2	274.2	334.4	358.5
8. Mineral rights sales by U.S. Govt	0	0	13.2	14.5	27.5	27.5
9. Financial net worth of monetary authorities	.3	−.3	.4	1.6	2.0	2.0
10.—NIA-FofF discrepancy	1.2	−1.3	2.1	12.1	14.2	14.1

Source: Table 4.3, last columns

The management of the budget since 1948 falls into three distinct periods. The first is 1948 through 1960. It was characterized by a small cumulative budget surplus of $8.9 billion, offset mainly by $10.4 billion in net leanding by the Federal Government ($10.4 billion is the difference between Federal lending of $21.6 billion and Federal borrowing of $11.2 billion from private and foreign lenders). The surplus averaged 0.3 percent of GNP. (See table 4.5.) It was a period of very stable monetary policy on the average: the cumulative increase in the monetary base was $3.2 billion, from $46.8 billion at the beginning of 1948 to $50.0 billion at the end of 1960 (see table A.1) for an average growth rate of 0.5 percent a year. For the same period old M1 rose at 1.7 percent a year on the average, and old M2 at 2.3 percent a year. The price level was nearly stable: The CPI rose at an average rate of 1.7 percent a year from 1948 to 1960. Concern was expressed about this high rate of inflation at the time! But in comparison with recent experience that period looks very good. There were three mild recessions—in 1949, 1954, and 1958—with annual unemployment rates rising 2 to 2½ percentage points from their previous lows to peaks of 5.9, 5.5, and 6.8 percent, and and with quarterly real GNP declining from its previous peak by 1.4, 3.3, and 3.2 percent, respectively. The budget was in deficit by 1 to 2 percent of GNP in each recession, with surpluses before and after (see table 4.5), thus providing some built-in stabilization. The monetary base and the other money stocks were not managed in a cyclically stabilizing manner; however: table 4.3 shows that the base was allowed to decline somewhat in each of these three recessions. Old M1 and M2 were allowed to grow more slowly as well. A policy of maintaining undiminished growth rates for the base and other money stocks during recessions would be preferable. It would of course allow short-term interest rates to go lower in recessions than did the policy of reducing the base.

The second period is 1961 through 1965. The year 1961 is chosen as its starting point because in 1961–63 there was an abrupt increase in Federal Reserve purchases of Treasury debt, from $0.4 billion a year in 1948–60 on average to $3 billion a year in 1963–65 on average.

(See Board of Governors [1976], pp. 25–27.) In 1961 through 1965 the authorities provided a small cumulative deficit amounting to $10.6 billion over the 5 years, averaging 0.4 percent of GNP (see table 4.5). The Federal Reserve financed it by increasing the monetary base somewhat faster than before; by $10.4 billion—from $50.0 billion to $60.5 billion (see table A.1)—for an average annual growth rate of 3.9 percent. The growth rates of M1A and M1B averaged 3.6 percent a year; the growth rate of M2, 8 percent. There was one mild recession, in 1960–61, when the annual unemployment rate rose 1.2 percentage points to 6.7 percent, and quarterly real GNP declined 1.2 percent from its previous peak. The expansionary shift in fiscal and monetary policy during this period helped to reduce the unemployment rate to 4.5 percent in 1965 (it was to go still lower in 1966–69), and there was as yet no sign of the faster inflation that follows more rapid increases of the monetary base. It was a time when the Administration could briefly claim that fine tuning of the economy was now possible in such a way as to maintain high employment with very little inflation (recall the points for 1959–65 in figure 5.1). Even as late as January 1969, President Johnson wrote in "The Economic Report of the President" (p. 4):

> Ever since the historic passage of the Employment Act in 1946, economic policies have responded to the fire alarm of recession and boom. In the 1960's, we have adopted a new strategy aimed at fire prevention—sustaining prosperity and heading off recession or serious inflation before they could take hold.

The third period is 1966 through 1979. Much more expansionary policies were followed beginning in 1966. It is sobering now to read the testimony of William McChesney Martin as Chairman of the Federal Reserve Board urging that Congress abolish (as in fact Congress did) the 25 percent gold reserve requirement against Federal Reserve deposits in 1965, and against Federal Reserve notes in 1968. Mr. Martin stated in 1968: "Removal of this requirement would in no way reduce our determination to preserve the soundness of the dollar." See the Federal Reserve Bulletin for February, 1965 and for February, 1968, p. 125.

Because of the unusually large deficits associated with the recession of 1975, let us consider 1966–74 and 1975–79 separately. (It is important to put all of the years 1971–74 into the same subperiod because much of the 12 percent increase in the consumer price index (CPI) during 1974 really belongs to 1971–73 but it could not come into the open until the price controls were lifted in 1974.)

In 1966–74 there was a deficit every year except 1969 when there was a surplus of $8.5 billion, not quite 1 percent of GNP. (See tables 4.3 and 4.5.) For the 9 years the deficit aggregated $81.0 billion, and averaged 0.9 percent of GNP. (See table 4.5.) Even though only about half of it, $45.1 billion, was financed by additions to the monetary base, this brought a large increase in the base, to $105.6 billion at the end of 1974. (See table A.1.) This meant that the average growth rate of the base during 1966 through 1974 was raised again, to 6.4 percent a year, clearly incompatible with price stability. The average growth rates of M1A, M1B and M2 were 5.6, 5.6, and 7.8 percent a year. The average CPI inflation rate from 1965 to 1974 was 5.1 percent a year. There was one mild recession, in 1970–71, with the annual employment rate rising 2.4 points to 5.9 percent and quarterly real GNP

declining 1.1 percent from its previous peak. The expansionary policies of 196–168 held the average unemployment rate to 3.7 percent in 1966–69, but this effect began to wear off as the slower-acting price effect began to appear. The annual unemployment rate was 4.9 percent in 1970 and again in 1973 but has not been below 5.6 percent in any other year since 1970.

In 1975–79 there was a deficit every year. For the 5 years it aggregated $209.6 billion and averaged 2.4 percent of GNP. In 1975 the deficit was $70.6 billion, or 4.6 percent of GNP. (See tables 4.3 and 4.5). This was a larger fraction of GNP than in any year of the Great Depression of the thirties (though it did not approach the 1944 wartime peak of 26 percent). Even though only about one-fourth of the cumulative deficit for 1975–79 was financed by additions to the monetary base, the increase was large ($49.8 billion in 5 years) which brought the base to $155.4 billion at the end of 1979 (see table A.1) for a still higher average growth rate of 8.4 percent a year, again clearly incompatible with price stability. The average annual growth rates of M1A, M1B, and M2 were 6.1, 7.0, and 10.9 percent.

The recession of 1975 was more severe than any since World War II, with the annual unemployment rate rising 3.5 percentage points to 8.5 percent, and quarterly real GNP declining 7 percent from its previous peak. The severity was partly due to the increase in imported oil prices which forced some reduction in our standard of living.

This brief sketch of macroeconomic policy in the United States since World War II gives strong support to the view that the authorities raised the growth rate of the monetary base too high, beginning in 1961, after a period of successfully limited monetary growth and nearly stable prices. This resulted in too-rapid growth of the money stocks M1A, M1B, and M2, without which the inflation could not have occurred.

Why was this inflationary policy followed? Arthur Burns, Chairman of the Federal Reserve from 1970 to March, 1978, had this to say [1979, p. 15]: "Viewed in the abstract, the Federal Reserve System had the power to abort the inflation at its incipient stage fifteen years ago or at any later point, and it has the power to end it today. At any time within that period, it could have restricted the money supply and created sufficient strains in financial and industrial markets to terminate the inflation with little delay. It did not do so because the Federal Reserve was itself caught up in the philosophic and political currents that were transforming American life and culture." He then referred to the Full Employment Act of 1946, which proclaims the responsibility of the Federal Government "to promote maximum employment, production, and purchasing power" without mentioning price stability among those goals.

According to the natural unemployment rate hypothesis, a rise in the inflation rate is accompanied by a temporary decrease in unemployment, and a decline in the inflation rate is accompanied by a temporary rise in unemployment. By how many percentage-point years was unemployment reduced between 1960 and 1973 by the stimulative policies that also increased the inflation rate? If we could answer this question, we could get a rough idea of how many percentage-point years of above-normal unemployment might be required to reduce the inflation rate to its 1948–59 level. Suppose that the natural

unemployment rate were 4.57 percent (the 1948–59 average) at the end of 1959, 6.77 percent (the 1973–78 average) in mid-1973, and followed a straight-line growth path between these two time points. The accompanying table 5.3 suggests that about 9.8 percentage-point years of unemployment were prevented by the stimulative policies of 1960–73, which also gave us the increase in the inflation rate. (Each period in table 5.3 begins and ends at a cyclically low rate of unemployment.) If the reverse process has an effect of similar size, this suggests we might expect about 10 percentage-point years of extra unemployment as an unpleasant side effect of reducing the inflation to its 1948–1959 level, e.g., 2½ percent for 4 years, or 2 percent for 5 years, or the like. Of course this is not a prediction, it is only an indication of a possible order of magnitude.

TABLE 5.3.—ROUGH ESTIMATE OF PERCENTAGE-POINT YEARS OF UNEMPLOYMENT PREVENTED BY STIMULATIVE POLICIES IN 1960–73

(1) Period (inclusive)	1948–59	1960–68	1969 to mid-1973	Mid-1973 to 1978	Sum for 1960 to mid-1973
(2) Years	12	9	4½	5½	13½
(3) Number of cycles	3	1	1	1	2
(4) Average unemployment rate, percent	4.57	4.92	4.97	6.77	----
(5) Assumed natural unemployment rate, percent, average[1]	4.57	5.30	6.40	6.77	----
(6) Difference, (5)–(4), percent	0	.38	1.43	0	----
(7) Percentage-point years of unemployment prevented, (2)×(6) except for last column	0	3.4	6.4	0	9.8

[1] Defined by linear interpolation between 4.57 percent (the 1948–59 average) at the end of 1959 and 6.77 percent (the 1973–78 average) in mid-1973.

In October 1979, the Federal Reserve announced its intention to reduce the growth of the money stocks gradually until noninflationary growth rates are attained. If this program is carried through, late 1979 will mark the beginning of a fourth postwar period for macroeconomic policy in which inflation is brought under control.

E. The Relation Between the Federal Debt and the Monetary Base

The frequency of government deficits and their magnitude in relation to GNP were increased after 1960, and those deficits were financed to a significant degree by the too-large increases in the monetary base, as we have seen. Perhaps if the deficits had not been so large, the Federal Reserve would not have been led to contribute so heavily to their financing by such large increases in the monetary base. That is the subject of this subsection.

Consider the relationship between the size of the Federal deficit and the rate of growth of the monetary base. When the financial authorities run a large deficit, do the monetary authorities have any choice but to help finance it by large additions to the monetary base? What would happen if the monetary authorities tried to maintain a slow growth rate of the base in the face of a large deficit?

Return again to table 5.2. It shows the sources of deficit finance that are available. Large continuing deficits can be financed only by the sale of securities either to the Federal Reserve (which increases the monetary base) or to private and foreign buyers on the open market

(which has other disadvantages as we will see). The other sources of finance, e.g., depletion of foreign exchange reserves, can make important contributions in the short run, but they would be exhausted by large sustained deficits in the long run.

When there is a large deficit, and hence a large issue of securities by the Treasury to finance it, the Federal Reserve is the agency that decides how much of that debt issue will be dumped on the open market (at whatever prices and interest rates will persuade the market to buy them) and how much will be transformed into an increase in the monetary base through purchase by the Federal Reserve.

Suppose the deficit is large and sustained. Then the Federal Reserve is in a box because undesirable consequences will follow no matter what it does.

To understand the nature of this box, it is helpful to make the distinction between nominal and real interest rates. Nominal rates are those typically quoted in the market, on savings accounts, mortgages, bonds, etc. Real rates are nominal rates adjusted for the rate of inflation. The adjustment is made according to this formula:

$$\text{real interest rate} = \frac{1 + \text{nominal interest rate}}{1 + \text{inflation rate}} - 1 \qquad (5.3)$$

For example, if the inflation rate were 20 percent a year and the nominal interest rate were 32 percent a year, then the real rate of interest would be $(1.32/1.20) - 1 = 1.10 - 1 = .10 = 10$ percent. If the nominal interest rate and the inflation rate are both small, say both less than 10 percent, then a quick approximation to the real interest rate can be found by subtracting the inflation rate from the nominal interest rate. This approximation for the preceding example yields (32 percent $-$20 percent) $=$12 percent, which is 2 percentage points too high.

The significance of this distinction is that business borrowers and consumer borrowers care more about the real rate of interest than about the nominal rate, for the real rate is what determines the cost of borrowing in terms of real resources such as labor, capital, and materials.

Note that the budget deficit, as stated in the Government budget restraint equation and in the corresponding tables 5.2 and 4.3, does not account for the erosion of the real purchasing power of the outstanding stocks of money and government bonds that occurs during inflation. This erosion is a capital loss to the holders of money and bonds but a gain to the Government. Thus the real value of the Government deficit, taking account of this capital gain, is less than the amounts shown in the tables when inflation is occurring. In early 1980, with privately held Federal Government debt net of Federal loans to the private sector amounting to about $350 billion and inflation in the neighborhood of 10 percent a year, the overstatement of the real value of the deficit amounted to about $35 billion a year.

Now let us return to the question of what difference the Federal Reserve's actions make when there is a large and sustained deficit.

Suppose first that the Federal Reserve buys only a small amount of the Treasury's sustained debt issues; just enough to maintain a small average growth rate of the monetary base, say at 1 or 2 percent a year

which would be consistent with a roughly constant price level. The great bulk of the Treasury's securities would be offered on the open market, year after year. The immediate effect, when the process begins, would be a reduction in bond prices and an increase in interest rates (both real and nominal since the price level is nearly constant). The longer term effect as the process continues would be still lower bond prices and still higher interest rates (real and nominal), as the market is asked to hold increasing quantities of government bonds. Some private borrowers would be priced out of the market, and thus private investment in plant and equipment and technology would be reduced. This is called "crowding out" of private investment by the government's borrowing. The average deficit in 1966–79 was 1.4 percent of GNP (table 4.5), which amounts to about one-fifth of net private domestic investment: a significant fraction.

Suppose instead that the Federal Reserve buys a large amount of the Treasury's sustained debt issues, enough to create rapid growth in the monetary base (as it has done since 1966). This produces first a temporary period of high employment and output (as in 1966–69), followed by continuous inflation. The effect on nominal interest rates is to reduce them when the process first starts but to raise them later by building an inflation premium into them as borrowers and lenders come to expect inflation to continue. The effect on real interest rates is to lower them at first, but the long-run effect is small and we are not sure whether it is positive or negative. However, if the sustained deficits are due to increased government purchases (rather than to reduced taxes), there will also be some crowding out of private expenditure.

In the first case, where the Federal Reserve sticks to slow monetary growth for the sake of price stability, we get high nominal interest rates, high real rates, and some crowding out of private investment. In the second case, where the Federal Reserve creates rapid monetary growth to help finance the deficits, we get inflation, high nominal interest rates, and perhaps some crowding out of private investment. Neither outcome is desirable. The fault here is not with the Federal Reserve, but with the fiscal authorities (the Congress and the Executive) for continuing to have large deficits.

Thus the happiest outcome would be obtained with small deficits, averaging at most about 0.5 percent of GNP over the business cycle, and a small average growth rate of the monetary base, about 1 or 2 percent a year for approximate price-level constancy.

Why is 0.5 percent of GNP about the highest acceptable size for the deficit, on the average? Consider that the net total of the monetary base, plus Federal debt in private and foreign hands, and less U.S. Government loans outstanding at the end of 1978, was $510 billion (table A.1, lines 26+30–7) or about 22 percent of GNP. A deficit of 0.5 percent of GNP would be about $12 billion, or about 2 percent of that $510 billion net total. Thus if the ratio of the monetary base to that net total were kept constant, a deficit of 0.5 percent of GNP would require a growth rate of about 2 percent a year in the monetary base, which would be about right for price stability. A smaller deficit than 0.5 percent of GNP, a balanced budget, or a small surplus—on the average over time, after an adjustment period—would also be accept-

able. But deficits averaging much over 0.5 percent of GNP would risk either inflation or the crowding out of investment.

The foregoing discussion does not support the proposal to amend the Constitution to require that the Federal budget be balanced every year. In fact, it would be pernicious to balance the budget every year in both high and low stages of the business cycle. The reason is that our fiscal system now has built-in stabilizing forces that increase the deficit (or decrease the surplus) in recession—thus helping to cushion the economy against the decline in expenditure that characterizes recession—and that decrease the deficit (or increase the surplus) at business cycle peaks, thus helping to moderate the high expenditure that characterizes the peak. If the budget were balanced every year, this would deprive us of those stabilizing effects, and business cycles would be rendered more severe.

F. Interest Rates

In this subsection we shall argue that if the average size of the budget deficit and the average growth rate of the monetary base are chosen correctly, the determination of interest rates can be left to the market, and no attempt need (or should) be made to control them.

Interest rates are important prices. They enter into decisions to consume, to save, and to invest. They affect many people. Large unforeseen changes in interest rates create large unforeseen capital gains and losses on long-term assets. Consequently it is not surprising that economic policymakers pay attention to variations in interest rates.

Interest rates are influenced by monetary policy. One rather popular view of monetary policy supposes that changes in interest rates are a reliable indicator of changes in the ease or tightness of monetary policy, and in particular that a rise in interest rates indicates a tightening of monetary policy, and a decline indicates an easing. However, for reasons alluded to earlier, this supposition is not reliable. Sometimes it is correct and sometimes just the reverse is correct. To understand the relation between monetary policy and variations in interest rates, it is necessary to distinguish short-term and long-term reactions to changes in monetary policy and to recognize that the long-term effect can be in the opposite direction from the short-term effect.

Imagine an initial situation in which the money stock is growing slowly and prices are stable. Imagine now a departure from that situation for a period of two months: The money stock is increased 2 percent the first month, returned to its former path the second month, and thereafter made to follow the same slow-growth path it was following before. Then the aforementioned popular view is correct: Interest rates will fall during the first month when the money stock is expanded, because higher asset prices and lower interest rates are required to persuade people to hold the larger money stock. Similarly, for the opposite reason, interest rates will rise to approximately their former path during the second month when the money stock is reduced to its former path.

Start from the same initial situation as before, but now imagine that the money stock is made to embark on a 2-percent-per-month

compound-growth path (which amounts to 27 percent a year) and is held to that path for several years. In the first month, interest rates will fall just as in the previous case. However, after several years of monetary growth at 27 percent a year, the economy will develop a rapid inflation, and interest rates will (if free to be determined in the market without regulation) rise to levels above the inflation rate, thus affording a positive real return. Then for the long-run effect the popular view is just backwards: The high interest rates are an indication that monetary policy has been so easy as to create rapid inflation. To make interest rates come back down and *remain down*, it is necessary to slow or stop the inflation. This requires a reduction in the rate of growth of the money stock. Its short-run effect will be to raise interest rates briefly, as money becomes scarcer than expected, but when the inflation rate comes down interest rates will come down too.

The fact that long-run and short-run effects of money-stock growth upon interest rates can be in opposite directions makes it impossible to deduce the degree of ease or tightness of current monetary policy from current changes in interest rates. Rising interest rates today may possibly be due to a tightening of monetary policy today, or they may be due to an easing of monetary policy last year which is now generating inflation and thus driving interest rates up as the continuation of inflation comes to be expected. Attempts to stabilize interest rates by open market operations can easily go wrong if the authorities try to hold the interest rate at a level that is not consistent with the going rate of inflation. For example, if the current inflation rate is 10 percent and the corresponding *equilibrium* short-term interest rate is 12 percent—with the authorities trying to maintain the *actual* short-term rate at 11 percent, the result will be an acceleration of inflation; this because in order to keep the rate below 12 percent the authorities must buy Treasury securities more rapidly than is consistent with 10-percent inflation.

If the average growth rate of the money stock is kept low in order to maintain price stability, and if the average budget deficit is kept small in order to avoid crowding out private borrowers, then interest rates will fluctuate mildly as the economy experiences mild business cycles, but they will not reach the extreme high levels that we have seen accompanying the inflation of the 1970's and early 1980.

It has been the Federal Reserve's practice for many years to conduct a large volume of open market operations in order to remove the seasonal variation that would otherwise occur in interest rates thus transferring the seasonal variation to the money stock (especially the currency stock). In view of the difficulty of interpreting the meaning of changes in interest rates, it would be preferable to cease seasonal variations in the money stock, or perhaps in the monetary base, and allow the seasonal changes in the demand for currency relative to deposits to be accompanied by seasonal variations in interest rates. Private investors and speculators are equal to this task. The Federal Reserve would then be better able to concentrate its attention on the growth rate of the money stock, where it belongs.

Interest-rate ceilings on bank deposits, savings and loan shares, certificates of deposit, and mortgages generally have harmful effects.

They should be gradually increased and then, after they have been raised above prevailing market rates, they should be abolished. Interest ceilings have existed for some years, doing little harm because they were usually above the rates set by the market and hence usually had no effect. With the adoption of inflationary monetary policy, however, market rates rose as the inflationary premium was incorporated into them. When market-clearing rates rose above the ceilings, lenders naturally switched their funds to other channels where interest rates could reflect market equilibrium. This had a particularly unfortunate effect on financial institutions that typically lend at long term and borrow at short term: they were locked into portfolios of long-term loans and investments made in earlier years at low rates, and were competing for borrowed short-term funds in a market where short rates became very high because of inflation. This is one of the many problems that would not have arisen had a noninflationary monetary policy been followed.

G. Uncertainty

When the future rate of inflation is uncertain, as at present, long-term planning by both savers and investors is seriously interferred with. Long-term financial commitments become very risky, for the real value of future payments will be high or low depending upon whether inflation is lower or higher than was expected. This applies to decisions about life insurance, retirement plans (including social security), long-term leases, and long-term financing of housing, plant, equipment, and technology. Part of the recent decline in capital spending and in productivity growth is surely due to uncertainty over future inflation rates.

In principle, once a constant inflation rate has heen established and adjusted to, it doesn't matter whether it is plus 10 percent, minus 10 percent, or zero. Of course, during the adjustment period required to switch from one constant inflation rate to another, large unanticipated wealth transfers occur between parties to long-term contracts, and there is much uncertainty until inflation has heen constant at the new rate long enough that people come to expect it to continue to be constant at the new rate. This adjustment period can be very long, perhaps 50 years, because there are many long-term pension and insurance and other contracts outstanding.

Although any constant moderate inflation rate will do as well as any other, once it has become established and adjusted to, experience strongly suggests that it is not possible to maintain any inflation rate approximately constant on the average over a long period, unless it is approximately zero. Whenever the inflation rate is much above zero, strong pressures arise to change it in both directions. Those who advocate an activist policy to stimulate aggregate demand will press for faster monetary growth, and those who seek a return to price stability will press for slower. An average inflation rate of zero appears to be easier to maintain than any other rate.

Another aspect of inflationary uncertainty concerns the effective real tax rate that individuals and firms will have to pay under our present tax law. Inflation pushes wages and salary earners into higher tax brackets and thus increases their real tax burden even though

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wages and salaries before tax may exactly keep up with inflation. Income from interest, dividends, and profits is subject to much worse distortion. Imagine for simplicity a corporation in the 50 percent tax bracket. Suppose it earns 10 percent in real terms before tax. If the inflation rate is zero, there is no distortion: its real tax rate is 50 percent and its after-tax return is 5 percent. But if the inflation rate is 11.1 percent, the nominal rate of return is 22.2 percent (since $1.10 \times 1.111 = 1.222$), the real tax rate is 100 percent, and the after-tax return is zero. And if the inflation rate is 25 percent, the nominal rate of return is 37.5 percent (since $1.1 \times 1.25 = 1.375$),the real tax rate is 150 percent, and the after-tax return is minus 5 percent. In principle it is possible to rewrite the tax code so that the real tax rate on everyone is independent of the inflation rate, but in practice it is very difficult and probably will never be done. This is another reason to opt for price stability.

H. The Exchange Rate, the Balance of Payments, and Foreign Exchange Reserves

In a closed economy, the values of government expenditures, tax receipts, the monetary base, and government debt in private hands are required to satisfy the Government budget restraint, equation (2.4). Therefore the authorities cannot exogenously fix the paths of all four of these policy variables. They can fix paths for at most three of them, any three. The Government budget restraint and the private economy together determine the fourth endogenously.

In an open economy, foreign exchange reserves appear as an additional variable in the Government budget restraint. (See equation (3.1).) The net increase in foreign exchange reserves is related to the exchange rate. We measure the exchange rate in dollars per unit of foreign currency. Then, after an adjustment period, a higher exchange rate (meaning a lower foreign value of the dollar) goes with a larger net increase in foreign exchange reserves. The authorities have two more variables to think about than in a closed economy: Foreign exchange reserves and the exchange rate. They can choose a path for either one of them exogenously and let the market determine the other one endogenously.

(*a*) Suppose the authorities choose a flexible exchange rate regime, a clean float. To do so, they exogenously fix the change in foreign exchange reserves at zero and let the market demand and supply of dollars determine the exchange rate endogenously. This is compatible with the choice of any one of the closed economy's four policy variables as endogenous (expenditures, taxes, the monetary base, and government debt held outside the Federal Reserve).

(*b*) Suppose the authorities choose to fix the exchange rate exogenously. They do so as follows. Whenever more dollars are supplied than demanded in the market at the chosen exchange rate, the authorities step in and buy the excess dollars, spending part of their foreign exchange reserves. This prevents the foreign value of the dollar from falling. Whenever more dollars are demanded than supplied at the chosen rate, the authorities sell the excess dollars, receiving foreign exchange in return, which they add to their reserves. This prevents the foreign value of the dollar from rising. Thus the

exchange rate is maintained at the chosen level, while the stock of foreign exchange reserves is determined endogenously, falling when dollars are in excess supply and rising when dollars are in excess demand. This too is compatible with the choice of any one of the closed economy's four policy variables as endogenous, with one proviso: that we do not run out of foreign exchange reserves. If we do run out, we no longer have the wherewithal to buy any excess supply of dollars, and so we can no longer prevent a decline in the foreign value of the dollar.

(*c*) Suppose the authorities choose to fix all four of the closed economy's policy variables exogenously, and leave both the exchange rate and foreign reserves to be determined endogenously. In principle this should be possible, but it might lead to rather wide fluctuations in the exchange rate because foreign exchange reserves must move in such a way as to satisfy the Government budget restraint (3.1); and the variable that must bear the burden of adjusting to make this happen is the exchange rate. This policy too might break down through the exhaustion of the stock of foreign exchange reserves.

(*d*) What if the authorities try to fix exogenously both the exchange rate and the change in foreign exchange reserves? Can they do so? No, because they cannot foresee disturbances quickly and accurately enough to offset them before they affect either the exchange rate or foreign exchange reserves. The difficulty here is similar to the difficulty of trying to fix the path of real income exogenously. It may be possible to fix an average path, about which the actual values fluctuate, but not the actual values themselves.

(*e*) The authorities may choose a managed ("dirty") float, by using either explicitly or implicitly a rule determining when to intervene in the foreign exchange market and by how much. Then both the exchange rate and foreign exchange reserves would be endogenous. This regime too would break down if foreign exchange reserves fell to zero, unless the rule prescribed floating rates at that juncture.

We have found that in an open economy, the authorities must consider the following 6 variables: Government expenditures, taxes, the monetary base, government debt outside the Federal Reserve, the exchange rate, and the change in foreign exchange reserves. Four of them can be chosen exogenously; two (at least) must be determined endogenously. Any choice is possible, with the following exceptions: (1) It is not possible to fix exogenously both foreign exchange reserves and the exchange rate; (2) if foreign exchange reserves are made endogenous and subsequently foreign exchange reserves fall to zero, the regime will break down because they cannot be negative.

J. Changes and Continuity Since World War II

The two most important changes in the financing of the Federal debt since World War II, as noted above, have been an increase in the frequency and size of Federal budget deficits (even as compared to GNP) and an increase in the use of additions to the monetary base as a means of financing. Other changes in Federal debt financing have been of minor importance in comparison.

It is important to note that there are some things that have not changed since World War II and on which we still can rely. One is

the positive relation between the rate of inflation and the growth rate of the monetary base. It remains true that rapid inflation cannot continue in the absence of, and cannot be stopped in the presence of, sustained rapid growth of the monetary base. As we have seen, this relationship, although not arithmetically precise, is compelling, and policymakers cannot successfully fly in the face of it.

Another is the negative relation between the amount of slack in the economy and the difference between the actual rate of inflation and the expected rate. This relation was incorrectly perceived when a stable Phillips-curve tradeoff was thought to exist between the rate of unemployment and the rate of inflation. A more nearly correct view is that the tradeoff is between the unemployment rate and the difference between the actual and expected rates of inflation. Abnormally low unemployment leads to an inflation rate higher than expected, while abnormally high unemployment leads to an inflation rate lower than expected (though perhaps still at a positive rate, if expected inflation was high). Thus it is possible to understand the simultaneous existence of inflation and unemployment in the 1970's.

VI. Projections to 1990

In this section we offer some conditional projections concerning the financing of the Federal debt and its implications to the year 1990. The reason the projections must be conditional is that no one knows how large the deficits in the Federal budget will be for the next decade nor how rapidly the Federal Reserve will accumulate Federal debt in its portfolio thus increasing the monetary base. We shall make our projections for three different values of each of these two magnitudes; one value that approximates recent policy decisions, one considerably lower (as recommended in this paper), and one considerably higher. The three values assumed for the budget deficit as a percentage of GNP are 0.5 percent which is the upper limit recommended herein, 3 percent which was the approximate average in the years 1975–79, and 6 percent. The three annual growth rates assumed for the monetary base are 1 percent as recommended approximately herein, 8 percent as in the years 1974–79, and 15 percent.

We shall base our projections on two additional assumptions. One is that real GNP will grow at an average rate of 2.5 percent a year (slightly less than 3.5 percent growth rate from 1948–79) as it did in the last complete business cycle peak to peak (1973–79). This of course will depend on the amounts of employment, investment and technical progress in the coming decade, which will be influenced in turn by the tax, expenditure, and monetary policies followed by the Federal Government.

The second additional assumption is that the income velocity of the monetary base will increase at an average rate of 2 percent a year, as it did from 1960 to 1978 with relatively little fluctuation. (See again table 5.1). This is consistent with a roughly constant velocity of M2. Of course, if the inflation rate is brought down, interest rates and the velocity of money will come down too.

The projections below are all based for simplicity on these two uniform assumptions concerning the growth rates of real output and of velocity. If as time passes these assumptions turn out to be incorrect, the projections can and should be adjusted to reflect the changes.

We will apply equation (5.2) to the monetary base, thus:

Growth rate of nominal GNP equals growth rate of real GNP plus inflation rate equals growth rate of monetary base plus growth rate of income velocity of monetary base (6.1)

Using our assumptions about the growth rate of real GNP and of the income velocity of the monetary base and rearranging terms in equation (6.1), we find the following expression for the rate of inflation:

Inflation rate equals growth rate of monetary base plus growth rate of income velocity of monetary base minus growth rate of real GNP equals growth rate of monetary base plus 2 percent minus 2.5 percent equals growth rate of monetary base minus 0.5 percent (6.2)

Table 6.1 records the different assumptions made, in columns (1), (3), and (8). It shows the conditional projections made for the 1990 values of the monetary base in column (2), the price level on a 1979 base in column (4), nominal GNP in columns (5) and (6), the increase in the monetary base as a percent of GNP in column (7), the nominal Federal budget deficit in column (9), the amount of deficit financing required from sources other than additions to the monetary base, expressed as a percentage of GNP, in column (10), and the net Federal debt as a percent of GNP in column (11).

Line 1 of table 6.1 shows the policy combination that we ought to be approximately following on a long-term basis, according to this paper: A growth rate of the monetary base averaging about 1 percent a year in column (1), and a Federal deficit averaging about 0.5 percent of GNP in column (8). If 1979 is taken as a benchmark, and if this policy had been in effect before 1979 and were continued until 1990, then prices would be essentially stable, growing at only 0.5 percent a year in column (3) to reach only 5.6 percent above the 1979 level by 1990 in column (4). The deficit would be $16 billion in 1990 in column (9), and the amount of deficit financing required from sources other than additions to the monetary base would be a modest 0.45 percent of GNP on the average in column (10), not enough to crowd out any significant amount of private investment.

It would be unwise to embark upon such a combination of policies abruptly, because a much more inflationary mix of monetary and fiscal policies has been followed in recent years, approximately the mix shown in line 5 of table 6.1. A gradual approach to the noninflationary and noncrowding-out policies of line 1 is to be preferred in order to give the economy time to adjust its expectations toward price stability and thus reduce the severity of any ensuing recession. A reduction in growth rate of the monetary base by 0.5 to 1 percentage point a year would be suitable. Starting from a growth rate of 8 percent a year as in late 1979, this would require a transition period of about 5 to 10 years. The Federal Reserve may have embarked on such a path in October 1979.

A continuation of the policies of the 1970's would yield a result approximately like line 5 of the table. Inflation would continue at about 7.5 percent a year, resulting in a price level more than twice as high in 1990 as in 1979. The nominal budget deficit by 1990 would be $203 billion. The amount of deficit financing required from sources other than additions to the monetary base would be about 2.6 percent of GNP, approximately the same as the average for 1975–79. This represents, in recent years, a third of net investment as a proportion of GNP and, therefore, gives cause for concern about the risk of crowding out.

TABLE 6.1.—CONDITIONAL PROJECTIONS TO 1990 FOR INFLATION AND THE U.S. GOVERNMENT DEFICIT AND ITS FINANCING

[Growth rates in percent]

Line	Monetary base		Price level		Nominal GNP		(Increase in monetary base)÷GNP 1990	Deficit÷GNP	Nominal deficit 1990	(Deficit to be financed other than by adding to the monetary base)÷GNP 1990	(Federal debt held privately and abroad net of Federal loans)÷GNP 1990
	Growth rate	1990 level	Growth rate	1990 level	Growth rate	1990 level	1×2÷6		6×8	8−7	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	1	173	0.5	1.056	3	3,279	0.0005	0.005	16	0.0045	0.15
2								.03	98	0.295	.39
3								.06	197	.0595	.67
4	8	362	7.5	2.216	10	6,759	.004	.005	34	.001	.05
5								.03	203	.026	.23
6								.06	406	.056	.45
7	15	723	14.5	4.435	17	13,323	.008	.005	67	−.003	.01
8								.03	400	.022	.15
9								.06	799	.052	.32

Sources: Cols. 1, 3, and 8: assumption. Col. 5: col. 3+2.5 percent. Cols. 2, 4, and 6: 1979 level projected to 1990 at indicated growth rate. Cols. 7, 9 and 10: as indicated at the head of the column. Col. 11: [cumulation of (deficit—increase in monetary base)]÷col. 6.

Units of measurement: Cols. 1, 3, 5: annual growth rates. Col. 2: billions of dollars. Col. 4: index with 1979 value equal to 1.000. Cols. 6 and 9: billions of dollars per year. Cols. 7, 8, and 10: pure numbers, ratios without any units.

Assumptions: see text.

Line 9 of the table portrays a policy of more inflation and more crowding out than we have been following recently. It would more than quadruple the price level by 1990 and would require deficit financing (other than by adding to the monetary base) in an amount that approaches recent total net investment as a proportion of GNP, thus posing a grave threat of crowding out private investment.

Numerical projections of unemployment are not presented in table 6.1, for cycles are difficult to project accurately. At the business cycle peak in 1979, the lowest monthly unemployment rate was 5.7 percent and the average for 1979 was 5.8 percent. At the trough in 1975, the annual average unemployment rate was 8.5 percent. These rates are about 2 percentage points higher than was typical of the 1950's. Several reasons have been suggested for this increase in unemployment rates. Among them are an increase in the labor force participation of women and youths (whose unemployment rates are typically somewhat higher than men's), improved unemployment compensation programs, broadened coverage of the minimum wage law, the 1972 requirement that in order to be eligible for AFDC welfare and for food stamps one must register with the U.S. Employment Service for work, and the deterioration of the quality of education in some schools. None of these factors appears headed for a spectacular reversal in the next decade or so. Hence it seems likely that unemployment rates in normal business cycles will fluctuate between about 6 and 8 percent. If the Federal Reserve adheres to the policy of gradually reducing the growth rates of the money stocks which was announced in October 1979, there will probably be a temporary increase in unemployment rates, just as there was a temporary decrease in 1966–69 following the adoption of a policy of more rapid monetary growth (recall table 5.3). How long would this temporary unemployment last? Until the general public and officials of firms and labor unions begin to believe that the anti-inflationary policy actually will be carried through. They are not likely to believe this until we have passed through one recession and recovery without abandoning the policy. Action, not just talk, is needed. The credibility of government pronouncements about the future effectiveness of anti-inflation programs is now almost nil. A period of 3 to 5 years might be required before unemployment subsides to a long-run normal path.

To ameliorate unemployment during this transition and in future recessions, I propose several measures. One is the abolition of the minimum wage law or at least the exemption of teenagers and young adults. Surely there are potential employers and workers who would like to get together at an annual wage of $6,000 for a year's work of 50 weeks at 40 hours a week, but that is illegal in 1980. And $6,600 will be illegal by January of 1981.

A second is the alteration of the unemployment compensation program—to have benefits begin after several weeks of unemployment rather than immediately but continue for a longer period than at present—in order to give protection against long bouts of unemployment but not against short ones.

A third is the use of countercyclical expenditure and tax programs designed to run a deficit during recessions but not during prosperity and financed only slightly by additions to the monetary base so that the growth of the base is maintained at a low non-inflationary rate on the average over time.

A fourth is mild countercyclical monetary policy to prevent the money stocks from declining in recession and from rising rapidly in prosperity as they have usually been allowed to do in the past.

Appendix. Consolidation of the Flow-of-Funds Accounts for the U.S. Government Sector and the Monetary Authorities Sector

The U.S. Government budget restraint given by equation (4.5) and tables 4.1 and 4.3 concerns the funds flows for the sector that is obtained by consolidating the U.S. Government sector and the monetary authorities sector in the flow-of-funds (FofF) accounts, canceling out all claims of either one against the other. This appendix describes how the author carried out the consolidation. (See the acknowledgement at the beginning of the study.)

The FofF statements of year-end outstandings and annual flows for the U.S. Government sector and the monetary authorities sector are given for 1946–75 in Board of Governors [1976], pages 22–27 and 110–115. The nine-digit numerical code numbers that identify each item in the FofF accounts, together with data for 1973–77, are given in Board of Governors [1978]; the two sectors in question are treated in tables 46–47 and 546–547. The data in these two sources are now obsolete, having been somewhat revised since their release. Quarterly updates and revisions are released by the Board of Governors under the title *Flow of Funds Accounts ( )th Quarter 19( )*.

Table A.1 shows the year-end outstandings for the consolidated U.S. Government and monetary authorities (USG+MA) sector for 1945 through 1978. We begin by describing the items in this table with the aid of the first four digits of the nine-digit code numbers that are found in the "CODE" column.

Look first at the third and fourth digits of the codes. Asset items are denoted by "30" or "40". Liability items are denoted by "31" or "41". Financial net worth items are denoted by "50".

Look now at the first two digits of the codes. Items that appear in the FofF statement for the USG sector are denoted by "31". Items that appear in the FofF statement for the MA sector are denoted by "71" [8] or "72" ("72" refers to the commercial banking sector; that is the source of the "vault cash of commercial banks" item in line 28, which is a liability of the MA sector). Items that were created in the consolidation of the USG and MA sectors are denoted by "32". The definition of each "32" item can be read from the indenting of the verbal descriptions of each line of the table, having regard to the minus signs that appear in those verbal descriptions For example, "deposits at commercial banks" in line 2 is defined as line 3−line 4+line 5. "Total financial assets" in line 1 is defined as the sum of lines 2, 6, 7, and 21. "U.S. government debt" in line 30 (held outside the Federal Reserve) is defined as the sum of lines 31, 32, 34, 36, 37, and 38 minus the sum of lines 33 and 35. And so on.

The consolidation of the USG and MA sectors was carried out as follows. First, find the FofF statements of year-end outstandings in one of the FofF publications. Board of Governors [1978] is especially convenient for this purpose because it contains the code number of each item. Second, put all the asset items from both the USG sector and the MA sector on the left side of an aggregate balance sheet, and all the liability and net worth items on the right side. Third, obtain the consolidated balance sheet of the USG + MA sector by netting out claims of the USG sector against the MA sector and claims of the MA sector against the USG sector. This is done by canceling out items that are included on both sides of the aggregate balance sheet that was obtained in the second step; these items are discussed individually below.

A fourth step was taken to obtain table A.1. Combine some of the individual items in the consolidated balance sheet into subtotals, shown in lines 2, 6, 7, 21, 26, 30, 39, and 40 in table A.1. The subtotals are the same year-end outstandings that appear in equation (4.3) in the text, namely, Treasury deposits at commercial banks (line 2), member-bank borrowing (line 6), U.S. Government loans except member-bank borrowing (line 7), gold and SDR's and foreign exchange reserves (line 21), the monetary base (high powered money, line 26), U.S. Government debt held outside the Federal Reserve (line 30), U.S. Government life and

[8] There is one exception, regarding items whose codes begin with "71"; it is noted in the memorandum to table A.2.

retirement insurance reserves (line 39), and financial net worth of the USG+MA sector (line 40).

The items netted out in the consolidation are as follows. Each is indicated explicitly in the stub of table A.1 by a particular line carrying a minus sign.

Line 4 is Treasury holdings of currency and of deposits at the Federal Reserve. It is a liability of the monetary authority (note that its code begins with 7131), and is also included in the U.S. Government's asset item "demand deposits and currency" (whose code begins with 3130, in line 3). Hence it is netted out so that the consolidated asset item "deposits at commercial banks" in line 2 will not include any claims of the U.S. Government against the monetary authority.

Line 14 is a U.S. Government liability. It is the seignorage on currency issued by the Treasury plus the value of SDR certificates held by the Federal Reserve. Line 15 is a monetary authority asset representing the face value of currency issued by the Treasury plus the value of the same SDR certificates. They are netted against each other to cancel out the value of SDR certificates and the seigncrage; the difference between them is the value of the silver at cost that is in the currency issued by the Treasury. It is a rather small item and does not seem to belong naturally to any of the eight major balance-sheet items. Hence it was combined with the two miscellaneous asset items, lines 19 and 20, and allocated to the major item "loans except to member banks" (line 7) which is the least homogeneous of the asset items and is large.

Lines 33 and 35 are Federal Reserve holdings of direct and guaranteed U.S. debt and of budget agency issues and loan participations. As such they are netted out against the total of U.S. Government debt in order to obtain the amount held outside the Federal Reserve (line 30).

There is one netting-out operation in table A.1 that is not the result of canceling out claims between the USG and MA sectors: Line 24, foreign deposits at the Federal Reserve excluding those held by the IMF, is an offset to foreign exchange reserves and hence is netted against them to obtain line 21, "gold, SDR's and official foreign exchange."

The original FofF statements of year-end outstandings for the separate USG and MA sectors can be recovered from table A.1, if desired, as follows. Ignore all items in table A.1 whose codes begin with "32". Ignore the minus signs that appear in the stub of the table. Put on the asset aide of the USG sector statement all items whose codes begin with "3130", and on the liability side all items whose codes begin with "3131". Put on the asset side of the MA statement all items whose codes begin with "7130" and the liability side all items whose codes begin with "7131" and also line 28 whose code begins with "7230" (this item was discussed earlier in the appendix).

This completes the description of table A.1, which is the statement of year-end outstandings for the consolidated USG+MA sector.

Table A.2 contains in lines 1–42 the corresponding statement of annual flows for the years 1946–1978. Recall that it is not exactly the same as the year-to-year change in outstandings for reasons explained in footnote 6 in the text.

Lines 43–48 show U.S. Governmeat receipts, expenditures, and surpluses according to the national income accounts (NIA).

Lines 48–54 correspond precisely to equation (4.1) in the text. This is the reconciliation (carried out in the FofF accounts) between the NIA and the FofF accounting system.

Lines 55–64 correspond to equation (4.5) and to tables 4.1 and 4.3 in the text, which express the U.S. government budget restraint.

Tables 4.3 to 4.6 in the text are the same as lines 55–64 of table A.2.

Table A.1

11 JUNE 1980
YEAR-END OUTSTANDINGS, 1945-79

YEAR-END OUTSTANDINGS, 1945-79

SECTOR STMT.OF FINANCIAL ASSETS & LIABILITIES, U.S. GOVT. & MONETARY AUTHORITY

BILLIONS OF DOLLARS

BILLIONS OF DOLLARS

	1945	1946	1947	1948	1949	1950	CODE		
1	62.959	41.957	52.167	57.073	56.904	64.643	324090035	TOTAL FINANCIAL ASSETS	1
2	23.777	1.669	1.567	2.516	3.235	3.177	324090005	DEPOSITS AT COMMERCIAL BANKS	2
3	26.937	4.214	3.662	4.847	5.186	4.948	313020001	DEMAND DEPOSITS & CURRENCY	3
4	3.264	2.665	2.206	2.448	2.133	1.961	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	1.34	120	111	117	182	190	313031003	TIME DEPOSITS	5
6	252	16	34	33	8	67	713068001	F.R. LOANS TO MEMBER BANKS	6
7	19.799	20.620	27.193	29.491	28.443	37.786	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	-	-	-	-	-	-	313061703	SPONS.AGCY.ISSUES--TREAS.	8
9	-	-	-	-	-	-	713061713	SPONS.AGCY.ISSUES--F.R.	9
10	1.384	1.038	945	991	1.462	1.777	313065005	MORTGAGES	10
11	3.827	7.255	11.632	12.958	13.811	14.199	313069005	OTHER LOANS	11
12	9.607	8.218	10.566	11.378	9.114	16.515	313078005	TAXES RECEIVABLE	12
13	900	100	-	-	-	400	313070003	TRADE CREDIT	13
14	2.310	2.436	2.408	2.403	2.384	2.374	313112003	- TREAS. CURR. & SDR CTFS.	14
15	4.183	4.406	4.406	4.433	4.442	4.480	713012003	TREAS. CURR. & SDR CTFS.	15
16	578	580	535	541	534	1.368	713022000	F.R. FLOAT	16
17	-	-	-	-	-	-	713069603	ACCEPTANCES	17
18	49	148	52	191	72	3	713068103	LOANS ON GOLD TO R.O.W.	18
19	1.480	1.230	1.315	1.221	1.257	1.252	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	130	81	150	181	135	160	713093005	MISC. ASSETS OF F.R.	20
21	19.879	19.652	23.373	25.033	25.218	23.619	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	18	-71	1.330	1.729	1.979	1.594	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	20.065	20.529	22.475	23.963	24.147	22.672	713011005	GOLD & FOREIGN EXCHANGE	23
24	1.204	836	432	659	807	647	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	285.976	263.594	259.594	255.856	259.260	259.761	324190035	TOTAL LIABILITIES	25
26	44.430	45.091	46.767	48.703	44.163	45.422	324100035	HIGH-POWERED MONEY	26
27	15.915	16.139	-17.899	20.479	16.563	17.681	713113001	MEMBER BANK RESERVE DEP.	27
28	1.809	2.446	2.216	1.978	2.015	2.174	723025001	VAULT CASH OF COML. BANKS	28
29	26.646	26.906	26.652	26.246	25.585	25.567	713125001	CURR. OUTSIDE COML. BANKS	29
30	235.650	210.472	203.368	196.658	203.478	201.627	324130035	U.S. GOVERNMENT DEBT	30
31	42.935	44.151	46.236	47.837	49.300	49.552	313133000	SAVINGS BONDS	31
32	208.239	183.777	174.498	166.341	167.366	166.557	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	24.262	23.350	22.559	23.333	18.885	20.778	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	308	105	68	915	1.004	382	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	-	-	-	-	-	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	2.079	666	-	-	-	1.100	313170005	TRADE DEBT	36
37	4.610	4.575	4.319	4.033	3.573	3.316	313190005	MISC. U.S.G. LIABILITIES	37
38	941	946	806	865	1.120	1.498	713190005	MISC. F.R. LIABILITIES	38
39	6.496	8.031	9.459	10.495	11.619	12.712	313154005	LIFE & RETIREMENT RESERVES	39
40	-223.320	-221.637	-207.427	-198.783	-202.356	-195.118	325000535	FINANCIAL N.W., U.S.G. & M.A.	40
41	-223.320	-221.637	-207.427	-198.783	-202.356	-195.118	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	-	-	-	-	-	-	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.1—Continued

11 JUNE 1980
YEAR-END OUTSTANDINGS, 1945-79

SECTOR STMT.OF FINANCIAL ASSETS & LIABILITIES, U.S. GOVT. & MONETARY AUTHORITY

BILLIONS OF DOLLARS

	1951	1952	1953	1954	1955	1956	CODE		
1	72.517	74.116	74.323	70.361	74.447	74.702	324090035	TOTAL FINANCIAL ASSETS	1
2	3.828	6.133	5.141	4.578	4.493	4.123	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	5.467	7.638	5.906	5.567	5.297	5.009	313020001	DEMAND DEPOSITS & CURRENCY	3
4	1.517	1.659	1.167	1.359	1.161	1.216	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	278	351	342	370	357	330	313031003	TIME DEPOSITS	5
6	19	127	13	10	107	25	713068001	F.R. LOANS TO MEMBER BANKS	6
7	44.906	43.705	46.141	43.289	47.459	47.213	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	5	2	-	1	20	9	313061703	SPONS.AGCY.ISSUES--TREAS.	8
9	-	-	-	-	-	-	713061713	SPONS.AGCY.ISSUES--F.R.	9
10	2.391	2.936	3.326	3.425	3.622	3.644	313065005	MORTGAGES	10
11	14.878	15.878	17.459	17.069	17.467	18.117	313069005	OTHER LOANS	11
12	21.601	17.998	18.537	15.541	18.234	16.388	313078005	TAXES RECEIVABLE	12
13	1.300	2.251	2.214	2.445	2.274	2.350	313076003	TRADE CREDIT	13
14	2.398	2.435	2.469	2.505	2.507	2.524	313112003	- TREAS. CURR. & SDR CTFS.	14
15	4.553	4.656	4.738	4.829	4.852	4.910	713012003	TREAS. CURR. & SDR CTFS.	15
16	1.184	967	935	868	1.585	1.665	713022000	F.R. FLOAT	16
17	-	-	-	-	28	69	713069603	ACCEPTANCES	17
18	5	34	17	134	2	26	713068103	LOANS ON GOLD TO R.O.W.	18
19	1.210	1.211	1.179	1.350	1.661	2.236	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	177	207	205	192	221	325	713093005	MISC. ASSETS OF F.R.	20
21	23.764	24.154	23.028	22.484	22.388	23.341	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	1.631	1.557	1.471	1.302	1.168	1.776	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	22.667	23.157	21.987	21.676	21.629	21.890	713011005	GOLD & FOREIGN EXCHANGE	23
24	534	560	430	494	409	325	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	262.176	268.649	275.287	276.798	277.231	273.202	324190035	TOTAL LIABILITIES	25
26	49.262	50.383	50.941	49.385	50.163	50.849	324100035	HIGH-POWERED MONEY	26
27	20.056	19.950	20.160	18.876	19.005	19.059	713113001	MEMBER BANK RESERVE DEP.	27
28	2.597	2.753	2.512	2.469	2.682	3.261	723025001	VAULT CASH OF COML. BANKS	28
29	26.509	27.680	28.269	28.040	28.476	28.529	713125001	CURR. OUTSIDE COML. BANKS	29
30	199.319	203.670	209.146	212.094	211.225	205.344	324130035	U.S. GOVERNMENT DEBT	30
31	49.081	49.173	49.371	49.966	50.229	50.135	313133000	SAVINGS BONDS	31
32	166.727	171.619	176.814	178.532	178.189	172.722	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	23.801	24.698	25.915	24.932	24.785	24.915	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	245	626	2.253	2.338	1.611	1.356	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	-	-	-	-	-	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	2.760	2.775	2.600	2.366	2.283	2.608	313170005	TRADE DEBT	36
37	3.274	2.931	2.691	2.481	2.222	2.003	313190005	MISC. U.S.G. LIABILITIES	37
38	1.093	1.244	1.332	1.343	1.476	1.435	713190005	MISC. F.R. LIABILITIES	38
39	13.595	14.596	15.200	15.319	15.843	17.009	313154005	LIFE & RETIREMENT RESERVES	39
40	-189.659	-194.533	-200.964	-206.437	-202.784	-198.500	325000535	FINANCIAL N.W., U.S.G. & M.A.	40
41	-189.659	-194.533	-200.964	-206.437	-202.784	-198.500	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	-	-	-	-	-	-	715000005	FINANCIAL N.W., MON. AUTH.	42

YEAR-END OUTSTANDINGS, 1945-79

BILLIONS OF DOLLARS

Table A.1—Continued

11 JUNE 1980

YEAR-END OUTSTANDINGS, 1945-79 — YEAR-END OUTSTANDINGS, 1945-79

SECTOR STMT.OF FINANCIAL ASSETS & LIABILITIES, U.S. GOVT. & MONETARY AUTHORITY

BILLIONS OF DOLLARS — BILLIONS OF DOLLARS

	1957	1958	1959	1960	1961	1962	CODE		
1	74.913	71.864	76.616	75.866	78.323	81.594	324090035	TOTAL FINANCIAL ASSETS	1
2	4.204	4.739	5.501	6.554	6.568	7.408	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	5.145	5.453	6.111	7.154	7.171	8.116	313020001	DEMAND DEPOSITS & CURRENCY	3
4	1.242	1.041	895	862	887	977	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	301	327	285	262	284	269	313031003	TIME DEPOSITS	5
6	50	46	453	25	115	37	713068001	F.R. LOANS TO MEMBER BANKS	6
7	46.192	44.818	49.511	50.154	53.181	57.221	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	13	3	2	37	35	-	313061703	SPONS.AGCY.ISSUES--TREAS.	8
9	-	-	-	-	-	-	713061713	SPONS.AGCY.ISSUES--F.R.	9
10	3.925	4.335	5.605	5.800	6.249	6.322	313065005	MORTGAGES	10
11	18.473	19.552	20.107	20.943	22.168	24.533	313069005	OTHER LOANS	11
12	14.406	11.957	14.115	12.675	13.155	13.697	313078005	TAXES RECEIVABLE	12
13	2.261	1.723	1.722	1.790	1.776	2.005	313070003	TRADE CREDIT	13
14	2.562	2.600	2.639	2.686	2.740	2.760	313112003	- TREAS. CURR. & SDR CTFS.	14
15	4.990	5.078	5.155	5.242	5.429	5.411	713012003	TREAS. CURR. & SDR CTFS.	15
16	1.424	1.296	1.590	1.868	2.300	2.903	713022000	F.R. FLOAT	16
17	66	49	75	74	51	110	713069603	ACCEPTANCES	17
18	5	18	5	8	15	1	713068103	LOANS ON GOLD TO R.O.W.	18
19	2.883	3.167	3.411	4.086	4.395	4.588	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	308	240	363	317	348	411	713093005	MISC. ASSETS OF F.R.	20
21	24.467	22.261	21.151	19.133	18.459	16.928	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	2.080	2.041	2.110	1.693	1.911	1.209	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	22.752	20.499	19.394	17.666	16.842	16.011	713011005	GOLD & FOREIGN EXCHANGE	23
24	365	279	353	226	294	292	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	271.955	280.054	287.887	285.208	293.336	301.202	324190035	TOTAL LIABILITIES	25
26	50.868	50.697	50.764	49.951	51.307	52.794	324100035	HIGH-POWERED MONEY	26
27	19.034	18.504	18.174	17.081	17.387	17.454	713113001	MEMBER BANK RESERVE DEP.	27
28	3.335	3.249	3.012	3.346	3.689	4.519	723025001	VAULT CASH OF COML. BANKS	28
29	28.499	28.944	29.578	29.524	30.231	30.821	713125001	CURR. OUTSIDE COML. BANKS	29
30	203.556	210.836	217.609	214.741	220.504	225.765	324130035	U.S. GOVERNMENT DEBT	30
31	48.226	47.703	45.907	45.642	46.445	46.968	313133000	SAVINGS BONDS	31
32	171.957	181.425	190.632	188.692	194.561	200.229	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	24.238	26.347	26.648	27.384	28.881	30.820	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	1.775	2.130	1.796	1.940	2.469	3.272	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	-	-	-	-	-	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	2.769	2.832	2.903	3.145	3.380	3.661	313170005	TRADE DEBT	36
37	1.709	1.537	1.348	1.161	1.037	815	313190005	MISC. U.S.G. LIABILITIES	37
38	1.358	1.556	1.671	1.545	1.493	1.641	713190005	MISC. F.R. LIABILITIES	38
39	17.531	18.521	19.514	20.516	21.525	22.643	313154005	LIFE & RETIREMENT RESERVES	39
40	-197.042	-208.190	-211.271	-209.342	-215.013	-219.608	325000535	FINANCIAL N.W., U.S.G. & M.A.	40
41	-197.042	-208.190	-211.271	-209.342	-215.013	-219.608	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	-	-	-	-	-	-	715000005	FINANCIAL N.W., MON. AUTH.	42

11 JUNE 1980
YEAR-END OUTSTANDINGS, 1945-79

YEAR-END OUTSTANDINGS, 1945-79

SECTOR STMT.OF FINANCIAL ASSETS & LIABILITIES, U.S. GOVT. & MONETARY AUTHORITY

BILLIONS OF DOLLARS

BILLIONS OF DOLLARS

	1963	1964	1965	1966	1967	1968	CODE		
1	84.299	87.463	89.099	92.544	93.786	101.438	324090035	TOTAL FINANCIAL ASSETS	1
2	6.749	6.988	5.724	5.444	6.066	5.556	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	7.730	8.302	6.902	6.816	8.266	6.586	313020001	DEMAND DEPOSITS & CURRENCY	3
4	1.241	1.586	1.428	1.592	2.467	1.398	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	260	272	250	220	267	368	313031003	TIME DEPOSITS	5
6	31	156	96	173	141	188	713068001	F.R. LOANS TO MEMBER BANKS	6
7	60.892	63.856	68.030	72.450	73.065	80.461	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	29	12	45	1.355	1.267	1.401	313061703	SPONS.AGCY.ISSUES—TREAS.	8
9	-	-	-	-	-	-	713061713	SPONS.AGCY.ISSUES—F.R.	9
10	5.917	5.870	5.853	6.831	7.824	9.261	313065405	MORTGAGES	10
11	26.349	29.211	32.028	34.256	37.966	41.289	313069005	OTHER LOANS	11
12	15.472	15.733	17.021	15.656	10.535	11.804	313078005	TAXES RECEIVABLE	12
13	2.490	2.734	3.122	4.371	5.839	6.414	313070003	TRADE CREDIT	13
14	2.806	2.830	3.064	3.963	4.646	5.062	313112003	- TREAS. CURR. & SDR CTFS.	14
15	5.422	5.249	5.419	6.161	6.628	6.795	713012063	TREAS. CURR. & SDR CTFS.	15
16	2.600	2.606	2.248	2.510	2.483	3.482	713022000	F.R. FLOAT	16
17	162	94	187	193	164	58	713069603	ACCEPTANCES	17
18	32	30	41	-	-	-	713068103	LOANS ON GOLD TO R.O.W.	18
19	4.874	4.788	4.679	4.430	4.336	4.113	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	351	359	451	650	671	906	713093005	MISC. ASSETS OF F.R.	20
21	16.627	16.403	15.249	14.477	14.434	15.233	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	1.229	1.034	1.137	905	1.304	3.340	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	15.614	15.638	14.313	13.977	13.526	12.370	713011005	GOLD & FOREIGN EXCHANGE	23
24	216	269	201	405	396	477	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	305.380	312.150	314.762	321.153	335.453	351.712	324190035	TOTAL LIABILITIES	25
26	54.741	57.469	60.503	64.457	68.259	72.821	324100035	HIGH-POWERED MONEY	26
27	17.049	17.850	18.447	19.794	21.092	21.859	713113001	MEMBER BANK RESERVE DEP.	27
28	4.259	4.532	4.851	5.450	5.931	7.195	723025001	VAULT CASH OF COML. BANKS	28
29	33.433	35.087	37.205	39.213	41.236	43.767	713125001	CURR. OUTSIDE COML. BANKS	29
30	226.704	229.393	227.522	228.599	237.702	248.077	324130035	U.S. GOVERNMENT DEBT	30
31	48.149	49.060	49.695	50.249	51.219	51.866	313133000	SAVINGS BONDS	31
32	203.129	207.562	208.224	210.006	217.944	227.771	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	33.593	37.044	40.768	44.282	49.112	52.937	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	3.163	4.048	4.515	5.808	9.900	12.994	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	-	-	34	38	-	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	3.562	3.359	3.866	4.335	5.104	5.103	313170005	TRADE DEBT	36
37	687	556	599	791	1.044	1.240	313190005	MISC. U.S.G. LIABILITIES	37
38	1.607	1.852	1.391	1.526	1.641	2.040	713190005	MISC. F.R. LIABILITIES	38
39	23.935	25.288	26.737	28.097	29.492	30.814	313154005	LIFE & RETIREMENT RESERVES	39
40	-221.081	-224.747	-225.663	-228.609	-241.747	-250.274	325000535	FINANCIAL N.W., U.S.G. & M.A.	40
41	-221.081	-224.747	-225.663	-228.609	-241.747	-250.274	315000005	FINANCIAL N.W. U.S. GOVT.	41
42	-	-	-	-	-	-	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.1—Continued

11 JUNE 1980
YEAR-END OUTSTANDINGS, 1945-79

YEAR-END OUTSTANDINGS, 1945-79

SECTOR STMT.OF FINANCIAL ASSETS & LIABILITIES, U.S. GOVT. & MONETARY AUTHORITY

BILLIONS OF DOLLARS

BILLIONS OF DOLLARS

	1969	1970	1971	1972	1973	1974	CODE		
1	103.965	105.233	108.161	112.428	117.002	126.609	324090035	TOTAL FINANCIAL ASSETS	1
2	5.971	9.057	11.527	11.742	10.226	5.436	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	7.729	10.181	13.491	13.336	12.646	8.257	313020001	DEMAND DEPOSITS & CURRENCY	3
4	1.969	1.587	2.484	2.200	2.859	3.298	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	211	463	520	606	439	477	313031003	TIME DEPOSITS	5
6	183	335	39	1.981	1.258	299	713068001	F.R. LOANS TO MEMBER BANKS	6
7	81.224	81.700	84.893	85.923	91.440	105.514	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	104	7	25	8	6	2.508	313061703	SPONS.AGCY.ISSUES—TREAS.	8
9	-	-	553	1.154	1.677	4.628	713061713	SPONS.AGCY.ISSUES—F.R.	9
10	10.231	10.533	10.153	9.470	8.871	10.293	313065005	MORTGAGES	10
11	44.746	47.228	49.740	52.913	56.585	60.258	313069005	OTHER LOANS	11
12	8.812	6.221	7.763	7.014	8.330	8.901	313078005	TAXES RECEIVABLE	12
13	7.333	6.556	4.852	4.033	4.307	5.305	313070003	TRADE CREDIT	13
14	5.334	5.956	6.446	6.979	7.401	7.733	313112003	- TREAS. CURR. & SDR CTFS.	14
15	6.849	7.549	8.027	8.713	9.116	9.653	713012003	TREAS. CURR. & SDR CTFS.	15
16	3.440	4.261	4.343	3.974	3.099	2.001	713022000	F.R. FLOAT	16
17	64	57	261	106	68	999	713069603	ACCEPTANCES	17
18	-	-	-	-	-	-	713068103	LOANS ON GOLD TO R.O.W.	18
19	4.214	4.378	4.571	4.449	5.420	5.508	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	776	866	1.051	1.068	1.362	3.193	713093005	MISC. ASSETS OF F.R.	20
21	16.587	14.141	11.702	12.782	14.078	15.360	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	4.491	3.573	2.094	2.627	2.887	4.312	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	12.273	10.914	10.073	10.524	11.491	11.571	713011005	GOLD & FOREIGN EXCHANGE	23
24	377	346	465	369	300	523	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	348.321	362.275	388.768	410.422	421.075	441.434	324190035	TOTAL LIABILITIES	25
26	75.970	81.243	88.767	92.163	99.557	105.586	324100035	HIGH-POWERED MONEY	26
27	22.085	24.150	27.788	25.647	27.060	25.843	713113001	MEMBER BANK RESERVE DEP.	27
28	7.320	7.047	7.541	8.648	10.688	11.640	723025001	VAULT CASH OF COML. BANKS	28
29	46.565	50.046	53.438	57.868	61.809	68.103	713125001	CURR. OUTSIDE COML. BANKS	29
30	239.952	246.146	262.201	277.314	278.263	289.739	324130035	U.S. GOVERNMENT DEBT	30
31	51.770	52.089	54.416	57.667	60.354	63.338	313133000	SAVINGS BONDS	31
32	226.588	239.153	262.846	273.857	279.077	288.120	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	57.154	62.142	70.218	69.986	78.516	80.501	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	10.609	9.576	8.454	9.267	9.626	9.390	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	-	33	170	302	585	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	4.775	4.193	3.518	3.398	3.514	4.206	313170005	TRADE DEBT	36
37	942	329	336	337	337	1.748	313190005	MISC. U.S.G. LIABILITIES	37
38	2.422	2.948	2.882	2.864	4.173	4.023	713190005	MISC. F.R. LIABILITIES	38
39	32.399	34.886	37.800	40.945	43.255	46.109	313154005	LIFE & RETIREMENT RESERVES	39
40	-244.356	-257.042	-280.607	-297.994	-304.073	-314.825	325000535	FINANCIAL N.W., U.S.G. & M.A.	40
41	-244.356	-257.042	-280.607	-297.994	-304.073	-314.825	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	-	-	-	-	-	-	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.1—Continued

11 JUNE 1980
YEAR-END OUTSTANDINGS, 1945-79

YEAR-END OUTSTANDINGS, 1945-79

SECTOR STMT.OF FINANCIAL ASSETS & LIABILITIES, U.S. GOVT. & MONETARY AUTHORITY

BILLIONS OF DOLLARS

BILLIONS OF DOLLARS

	1975	1976	1977	1978	1979	CODE		
1	142.136	169.819	177.526	214.874	246.214	324090035	TOTAL FINANCIAL ASSETS	1
2	3.957	5.019	8.000	15.158	15.649	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	11.153	15.141	14.628	18.652	19.211	313020001	DEMAND DEPOSITS & CURRENCY	3
4	7.788	10.853	7.506	4.436	4.569	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	572	731	878	942	1.007	313031003	TIME DEPOSITS	5
6	229	25	265	1.172	1.454	713068001	F.R. LOANS TO MEMBER BANKS	6
7	122.208	137.675	150.562	180.568	210.968	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	7.012	10.750	16.095	23.825	32.050	313061703	SPONS.AGCY.ISSUES—TREAS.	8
9	5.623	6.401	7.865	7.513	8.248	713061713	SPONS.AGCY.ISSUES—F.R.	9
10	13.517	10.455	10.225	9.854	10.890	313065005	MORTGAGES	10
11	67.677	75.955	82.775	95.832	109.005	313069005	OTHER LOANS	11
12	5.800	11.337	10.054	13.594	17.290	313078005	TAXES RECEIVABLE	12
13	6.495	6.948	6.186	8.912	10.856	313070003	TRADE CREDIT	13
14	8.670	9.859	10.159	10.683	12.293	313112003	- TREAS. CURR. & SDR CTFS.	14
15	10.612	12.010	12.581	13.146	14.883	713012003	TREAS. CURR. & SDR CTFS.	15
16	3.688	2.601	3.810	6.516	6.767	713022000	F.R. FLOAT	16
17	1.126	991	954	587	704	713069603	ACCEPTANCES	17
18	-	-	-	-	-	713068103	LOANS ON GOLD TO R.O.W.	18
19	6.114	7.078	7.752	8.519	9.438	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	3.214	3.008	2.424	2.953	3.130	713093005	MISC. ASSETS OF F.R.	20
21	15.742	18.100	18.699	17.976	18.143	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	4.571	7.004	7.603	5.402	5.300	313011005	GOLD, SDR'S & OFF.FGN.EXCH.	22
23	11.655	11.743	11.714	13.248	13.628	713011005	GOLD & FOREIGN EXCHANGE	23
24	484	647	618	674	785	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	530.854	606.366	677.008	748.822	798.322	324190035	TOTAL LIABILITIES	25
26	112.599	118.875	130.681	145.868	155.392	324100035	HIGH-POWERED MONEY	26
27	26.052	25.158	26.870	31.223	29.792	713113001	MEMBER BANK RESERVE DEP.	27
28	12.252	12.121	13.922	15.470	18.488	723025001	VAULT CASH OF COML. BANKS	28
29	74.295	81.596	89.889	99.175	107.112	713125001	CURR. OUTSIDE COML. BANKS	29
30	368.350	432.847	485.034	534.438	566.111	324130035	U.S. GOVERNMENT DEBT	30
31	67.363	72.018	76.762	80.691	79.876	313133000	SAVINGS BONDS	31
32	369.944	434.427	487.332	538.516	578.092	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	87.934	97.021	102.819	110.562	117.458	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	8.947	9.311	8.425	6.993	5.592	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	567	671	590	516	461	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	5.651	10.912	11.682	14.056	14.458	313170005	TRADE DEBT	36
37	1.150	675	25	25	25	313190005	MISC. U.S.G. LIABILITIES	37
38	3.797	4.096	4.217	5.235	5.987	713190005	MISC. F.R. LIABILITIES	38
39	49.905	54.644	61.293	68.516	76.819	313154005	LIFE & RETIREMENT RESERVES	39
40	-388.718	-445.547	-499.482	-533.948	-552.108	325000535	FINANCIAL N.W., U.S.G. & M.A.	40
41	-388.718	-445.547	-499.482	-533.948	-552.108	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	-	-	-	-	-	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.2

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1945	1946	1947	1948	1949	1950	CODE		
1		-21.501	10.215	4.919	-90	7.771	324090035	TOTAL FINANCIAL ASSETS	1
2		-22.108	-102	949	719	-58	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3		-22.723	-552	1.185	339	-238	313020001	DEMAND DEPOSITS & CURRENCY	3
4		-599	-459	242	-315	-172	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5		16	-9	6	65	8	313031003	TIME DEPOSITS	5
6		-186	18	-1	-25	59	713068001	F.R. LOANS TO MEMBER BANKS	6
7		20	6.578	2.311	-969	9.369	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8		-	-	-	-	-	313061703	SPONS.AGCY.ISSUES—TREAS.	8
9		-	-	-	-	-	713061713	SPONS.AGCY.ISSUES—F.R.	9
10		-346	-93	46	471	315	313065005	MORTGAGES	10
11		2.626	4.381	1.330	819	418	313069005	OTHER LOANS	11
12		-1.389	2.348	812	-2.264	7.401	313078005	TAXES RECEIVABLE	12
13		-800	-100	-	-	400	313070003	TRADE CREDIT	13
14		126	-28	-5	-19	-10	313112003	- TREAS. CURR. & SDR CTFS.	14
15		223	-	27	9	38	713012003	TREAS. CURR. & SDR CTFS.	15
16		2	-45	6	-7	834	713022000	F.R. FLOAT	16
17		-	-	-	-	-	713069603	ACCEPTANCES	17
18		99	-96	139	-119	-69	713068103	LOANS ON GOLD TO R.O.W.	18
19		-250	86	-85	149	-3	313090005	MISC. ASSETS OF U.S. GOVT.	19
20		-19	69	31	-46	25	713093005	MISC. ASSETS OF F.R.	20
21		773	3.721	1.660	185	-1.599	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22		-89	1.401	399	149	-284	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23		464	1.946	1.488	184	-1.475	713011005	GOLD & FOREIGN EXCHANGE	23
24		-398	-374	227	148	-160	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25		-22.464	-4.006	-3.790	3.370	516	324190035	TOTAL LIABILITIES	25
26		661	1.676	1.936	-4.540	1.259	324100035	HIGH-POWERED MONEY	26
27		224	1.760	2.580	-3.916	1.118	713113001	MEMBER BANK RESERVE DEP.	27
28		177	170	-238	37	159	723025001	VAULT CASH OF COML. BANKS	28
29		260	-254	-406	-661	-18	713125001	CURR. OUTSIDE COML. BANKS	29
30		-24.660	-7.110	-6.762	6.786	-1.836	324130035	U.S. GOVERNMENT DEBT	30
31		1.216	2.085	1.601	1.463	252	313133000	SAVINGS BONDS	31
32		-24.462	-9.279	-8.157	1.025	-809	313161105	DIRECT & GUAR.TREAS. SECS.	32
33		-912	-791	774	-4.448	1.893	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34		-203	-37	847	89	-622	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35		-	-	-	-	-	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36		-2.013	-666	-	-	1.100	313170005	TRADE DEBT	36
37		-35	-256	-286	-460	-257	313190005	MISC. U.S.G. LIABILITIES	37
38		-75	252	7	221	393	713190005	MISC. F.R. LIABILITIES	38
39		1.535	1.428	1.036	1.124	1.093	313154005	LIFE & RETIREMENT RESERVES	39
40		963	14.221	8.709	-3.460	7.255	325000535	FINANCIAL N.W. USG & MA	40
41		881	14.215	8.657	-3.494	7.270	315000005	FINANCIAL N.W., U.S. GOVT.	41
42		82	6	52	34	-15	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

CONTINUED
ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR							BILLIONS OF DOLLARS PER YEAR	
1945	1946	1947	1948	1949	1950	CODE		
43	39.105	43.220	43.218	38.706	50.035	316010005	U.S. GOVT. RECEIPTS, N.I.A.	43
44	35.582	29.836	34.902	41.344	40.827	316900005	U.S.GOVT. EXPENDITURES, N.I.A.	44
45	17.617	12.698	16.700	20.410	18.724	316901001	GOODS & SERVICES	45
46	3.912	4.076	4.131	4.264	4.351	316132001	NET INTEREST	46
47	14.053	13.062	14.071	16.670	17.752	316400205	TRANSFERS, ETC.	47
48	3.523	13.384	8.316	-2.638	9.208	316061105	U.S. GOVT. SURPLUS, N.I.A.	48
49	1.535	1.428	1.036	1.124	1.093	313154005	LIFE & RETIREMENT RESERVES	49
50	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	50
51	1.107	-2.259	-1.377	-268	845	317005005	N.I.A.-F.O.F. DISCREPANCY	51
52	881	14.215	8.657	-3.494	7.270	315000005	FINANCIAL N.W. U.S. GOVT.	52
53	963	14.221	8.709	-3.460	7.255	325000535	FINANCIAL N.W., USG & MA	53
54	82	6	52	34	-15	715000005	- FINANCIAL N.W. MON. AUTH.	54
55	3.523	13.384	8.316	-2.638	9.208	316061105	U.S. GOVT. SURPLUS, N.I.A.	55
56	-22.108	-102	949	719	-58	324000005	DEPOSITS AT COML. BANKS	56
57	-186	18	-1	-25	59	713068001	F.R. LOANS TO MEMBER BANKS	57
58	20	6.578	2.311	-969	9.369	324030035	LOANS EXCEPT TO MEMBER BANKS	58
59	773	3.721	1.660	185	-1.599	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	59
60	661	1.676	1.936	-4.540	1.259	324100035	- HIGH-POWERED MONEY	60
61	-24.660	-7.110	-6.762	6.786	-1.836	324130035	- U.S. GOVERNMENT DEBT	61
62	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	62
63	82	6	52	34	-15	715000005	- FINANCIAL N.W. MON. AUTH.	63
64	1.107	-2.259	-1.377	-268	845	317005005	N.I.A.-F.O.F. DISCREPANCY	64

MEMORANDUM:

EACH LINE IN LINES 1-64 ABOVE (OTHER THAN TOTALS HAVING CODE NUMBERS BEGINNING WITH 32) APPEARS IN THE FLOW OF FUNDS TABLE OF FLOWS FOR EITHER THE U.S. GOVERNMENT SECTOR OR THE MONETARY AUTHORITY SECTOR, EXCEPT FOR 713061713 AND 713061705 IN LINES 9 AND 35. THEIR SUM APPEARS IN THE MONETARY AUTHORITY SECTOR TABLE AS THE ASSET ITEM "AGENCY ISSUES" 713061703.

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1951	1952	1953	1954	1955	1956	CODE		
1	7.863	1.554	-1.172	-3.955	4.223	292	324090035	TOTAL FINANCIAL ASSETS	1
2	651	2.302	-989	-563	-85	-370	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	119	2.371	-1.532	-339	-270	-288	313020001	DEMAND DEPOSITS & CURRENCY	3
4	-444	142	-552	252	-198	55	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	88	73	-9	28	-13	-27	313031003	TIME DEPOSITS	5
6	-48	108	-114	-3	97	-82	713068001	F.R. LOANS TO MEMBER BANKS	6
7	7.115	-1.246	1.057	-2.845	4.307	-209	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	5	-3	-2	1	19	-11	313061703	SPONS.AGCY.ISSUES--TREAS.	8
9	-	-	-	-	-	-	713061713	SPONS.AGCY.ISSUES--F.R.	9
10	614	513	390	99	197	22	313065005	MORTGAGES	10
11	679	1.002	181	-384	503	667	313069005	OTHER LOANS	11
12	5.086	-3.603	539	-2.996	2.693	-1.846	313078005	TAXES RECEIVABLE	12
13	900	951	-37	231	-171	76	313070003	TRADE CREDIT	13
14	24	37	34	36	2	19	313112003	- TREAS. CURR. & SDR CTFS.	14
15	73	103	82	91	23	58	713012003	TREAS. CURR. & SDR CTFS.	15
16	-184	-217	-32	-127	777	80	713022000	F.R. FLOAT	16
17	-	-	-	-	28	41	713069603	ACCEPTANCES	17
18	2	29	-17	117	-132	24	713068103	LOANS ON GOLD TO R.O.W.	18
19	-53	-16	-11	172	343	595	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	17	30	-2	-13	29	104	713093005	MISC. ASSETS OF F.R.	20
21	145	390	-1.126	-544	-96	953	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	37	-74	-86	-169	-134	608	313011005	GOLD, SDR'S & OFF.FGN.EXCH.	22
23	-5	490	-1.170	-311	-47	261	713011005	GOLD & FOREIGN EXCHANGE	23
24	-113	26	-130	64	-85	-84	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	2.385	6.429	6.597	1.474	254	-3.677	324190035	TOTAL LIABILITIES	25
26	3.840	1.121	558	-1.556	778	686	324100035	HIGH-POWERED MONEY	26
27	2.375	-106	210	-1.284	129	54	713113001	MEMBER BANK RESERVE DEP.	27
28	523	56	-241	-43	213	579	723025001	VAULT CASH OF COML. BANKS	28
29	942	1.171	589	-229	436	53	713125001	CURR. OUTSIDE COML. BANKS	29
30	-2.338	4.307	5.435	2.911	-1.048	-2.529	324130035	U.S. GOVERNMENT DEBT	30
31	-471	92	198	595	263	-94	313133000	SAVINGS BONDS	31
32	170	4.892	5.195	1.718	-343	-5.467	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	3.023	897	1.217	-983	-147	130	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	-137	381	1.627	85	-727	-255	313161755	BUDG.AGCY.ISS.:MTGS.& L.P.	34
35	-	-	-	-	-	-	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	1.600	75	-175	-234	-83	325	313170005	TRADE DEBT	36
37	-42	-343	-240	-210	-406	186	313190005	MISC. U.S.G. LIABILITIES	37
38	-435	107	47	-26	101	-94	713190005	MISC. F.R. LIABILITIES	38
39	883	1.001	604	119	524	1.166	313194005	LIFE & RETIREMENT RESERVES	39
40	5.478	-4.875	-7.769	-5.429	3.969	3.969	325000535	FINANCIAL N.W. USG & MA	40
41	5.448	-4.919	-7.810	-5.466	3.937	3.916	315000005	FINANCIAL N.W.: U.S. GOVT.	41
42	30	44	41	37	32	53	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

CONTINUED
ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1951	1952	1953	1954	1955	1956	CODE		
43	64.277	67.317	70.032	63.738	72.559	77.985	316010005	U.S. GOVT. RECEIPTS, N.I.A.	43
44	57.769	71.052	77.108	69.772	68.142	71.918	316900005	U.S.GOVT. EXPENDITURES, N.I.A.	44
45	38.322	52.365	57.530	47.933	44.455	45.902	316901001	GOODS & SERVICES	45
46	4.447	4.457	4.554	4.644	4.598	5.071	316132001	NET INTEREST	46
47	15.000	14.236	15.024	17.195	19.089	20.945	316400205	TRANSFERS, ETC.	47
48	6.508	-3.735	-7.076	-6.034	4.417	6.067	316061105	U.S. GOVT. SURPLUS, N.I.A.	48
49	883	1.001	604	119	524	1.166	313154005	LIFE & RETIREMENT RESERVES	49
50	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	50
51	177	183	130	-687	-44	985	317005005	N.I.A.-F.O.F. DISCREPANCY	51
52	5.448	-4.919	-7.810	-5.466	3.937	3.916	315000005	FINANCIAL N.W.: U.S. GOVT.	52
53	5.478	-4.875	-7.769	-5.429	3.969	3.969	325000535	FINANCIAL N.W.: USG & MA	53
54	30	44	41	37	32	53	715000005	- FINANCIAL N.W.: MOM. AUTH.	54
55	6.508	-3.735	-7.076	-6.034	4.417	6.067	316061105	U.S. GOVT. SURPLUS, N.I.A.	55
56	481	2.302	-989	-563	-85	-370	324000005	DEPOSITS AT COML. BANKS	56
57	-68	108	-114	-3	97	-82	713068001	F.R. LOANS TO MEMBER BANKS	57
58	7.115	-1.246	1.057	-2.845	4.307	-209	324030035	LOANS EXCEPT TO MEMBER BANKS	58
59	145	390	-1.126	-544	-96	953	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	59
60	3.840	1.121	558	-1.556	778	686	324100035	- HIGH-POWERED MONEY	60
61	-2.338	4.307	5.435	2.911	-1.048	-5.529	324130035	- U.S. GOVERNMENT DEBT	61
62	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	62
63	30	44	41	37	32	53	715000005	- FINANCIAL N.W.: MOM. AUTH.	63
64	177	183	130	-687	-44	985	317005005	N.I.A.-F.O.F. DISCREPANCY	64

MEMORANDUM:

EACH LINE IN LINES 1-64 ABOVE (OTHER THAN TOTALS HAVING CODE NUMBERS BEGINNING WITH 32) APPEARS IN THE FLOW OF FUNDS TABLE OF FLOWS FOR EITHER THE U.S. GOVERNMENT SECTOR OR THE MONETARY AUTHORITY SECTOR, EXCEPT FOR 713061713 AND 713061705 IN LINES 9 AND 35. THEIR SUM APPEARS IN THE MONETARY AUTHORITY SECTOR TABLE AS THE ASSET ITEM "AGENCY ISSUES" 713061703.

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1957	1958	1959	1960	1961	1962	CODE		
1	236	-2.991	4.480	-770	2.580	2.986	324090035	TOTAL FINANCIAL ASSETS	1
2	81	535	762	1.053	14	840	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	136	308	658	1.043	17	945	313020001	DEMAND DEPOSITS & CURRENCY	3
4	26	-201	-146	-33	25	90	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	-29	26	-42	-23	22	-15	313031003	TIME DEPOSITS	5
6	25	-4	407	-428	90	-78	713068001	F.R. LOANS TO MEMBER BANKS	6
7	-996	-1.316	4.421	623	3.150	3.755	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	4	-10	-1	35	-2	-35	313061703	SPONS.AGCY.ISSUES--TREAS.	8
9	-	-	-	-	-	-	713061713	SPONS.AGCY.ISSUES--F.R.	9
10	281	410	1.270	195	449	73	313065005	MORTGAGES	10
11	336	1.092	514	800	1.212	1.913	313069005	OTHER LOANS	11
12	-1.982	-2.449	2.158	-1.440	480	542	313078005	TAXES RECEIVABLE	12
13	-89	-538	-1	68	-14	229	313070003	TRADE CREDIT	13
14	36	38	39	47	54	20	313112003	- TREAS. CURR. & SDR CTFS.	14
15	80	88	77	87	187	-18	713012003	TREAS. CURR. & SDR CTFS.	15
16	-241	-128	294	278	453	603	713022000	F.R. FLOAT	16
17	-3	-17	26	-1	-23	59	713069603	ACCEPTANCES	17
18	-21	13	-13	3	7	-14	713068103	LOANS ON GOLD TO R.O.W.	18
19	692	329	13	691	425	360	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	-17	-68	123	-46	30	63	713093005	MISC. ASSETS OF F.R.	20
21	1.126	-2.206	-1.110	-2.018	-674	-1.531	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	304	-39	69	-417	218	-702	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	862	-2.253	-1.105	-1.728	-824	-831	713011005	GOLD & FOREIGN EXCHANGE	23
24	40	-86	74	-127	68	-2	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	-1.361	8.063	7.610	-2.479	8.045	7.937	324190035	TOTAL LIABILITIES	25
26	19	-171	67	-813	1.356	1.487	324100035	HIGH-POWERED MONEY	26
27	-25	-530	-330	-1.093	306	67	713113001	MEMBER BANK RESERVE DEP.	27
28	74	-86	-237	334	343	830	723025001	VAULT CASH OF COML. BANKS	28
29	-30	445	634	-54	707	590	713125001	CURR. OUTSIDE COML. BANKS	29
30	-1.902	7.244	6.550	-2.668	5.680	5.332	324130035	U.S. GOVERNMENT DEBT	30
31	-1.909	-523	-1.796	-265	803	523	313133000	SAVINGS BONDS	31
32	-765	9.468	9.207	-1.940	5.869	5.667	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	-677	2.109	301	736	1.497	1.939	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	419	355	-334	144	529	803	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	-	-	-	-	-	713061705	- F.R. HOLDINGS B.A.E.& L.P.	35
36	161	63	71	242	235	281	313170005	TRADE DEBT	36
37	-339	-149	-604	42	-160	-105	313190005	MISC. U.S.G. LIABILITIES	37
38	-146	139	307	-155	-99	102	713190005	MISC. F.R. LIABILITIES	38
39	522	990	993	1.002	1.009	1.118	313154005	LIFE & RETIREMENT RESERVES	39
40	1.597	-11.054	-3.130	1.709	-5.465	-4.951	325000535	FINANCIAL N.W. USG & MA	40
41	1.528	-11.113	-2.938	1.680	-5.532	-4.997	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	69	59	-192	29	67	46	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

CONTINUED
ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

	1957	1958	1959	1960	1961	1962	CODE		
43	81.966	78.662	89.826	96.141	98.058	106.187	316010005	U.S. GOVT. RECEIPTS, N.I.A.	43
44	79.624	88.933	90.964	93.106	101.944	110.434	316900005	U.S.GOVT. EXPENDITURES, N.I.A.	44
45	49.966	53.904	53.890	53.711	57.370	63.738	316901001	GOODS & SERVICES	45
46	5.538	5.208	6.165	6.806	6.248	6.758	316132001	NET INTEREST	46
47	24.122	29.821	30.909	32.589	38.326	39.938	316400205	TRANSFERS, ETC.	47
48	2.282	-10.271	-1.138	3.035	-3.886	-4.247	316061105	U.S. GOVT. SURPLUS, N.I.A.	48
49	522	990	993	1.002	1.009	1.118	313154005	LIFE & RETIREMENT RESERVES	49
50	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	50
51	232	-148	807	353	637	-368	317005005	N.I.A.-F.O.F. DISCREPANCY	51
52	1.528	-11.113	-2.938	1.689	-5.532	-4.997	315000005	FINANCIAL N.W., U.S. GOVT.	52
53	1.597	-11.054	-3.130	1.709	-5.465	-4.951	325000535	FINANCIAL N.W., USG & MA	53
54	69	59	-192	29	67	46	715000005	- FINANCIAL N.W., MON. AUTH.	54
55	2.282	-10.271	-1.138	3.035	-3.886	-4.247	316061105	U.S. GOVT. SURPLUS, N.I.A.	55
56	81	535	762	1.053	14	840	324000005	DEPOSITS AT COML. BANKS	56
57	25	-4	407	-428	90	-78	713068001	F.R. LOANS TO MEMBER BANKS	57
58	-996	-1.316	4.421	623	3.150	3.755	324030035	LOANS EXCEPT TO MEMBER BANKS	58
59	1.126	-2.206	-1.110	-2.018	-674	-1.531	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	59
60	19	-171	67	-813	1.356	1.487	324100035	- HIGH-POWERED MONEY	60
61	-1.902	7.244	6.550	-2.668	5.680	5.332	324130035	- U.S. GOVERNMENT DEBT	61
62	-	-	-	-	-	-	105030003	- MINERAL RIGHTS SALES	62
63	69	59	-192	29	67	46	715000005	- FINANCIAL N.W., MON. AUTH.	63
64	232	-148	807	353	637	-368	317005005	N.I.A.-F.O.F. DISCREPANCY	64

MEMORANDUM:

EACH LINE IN LINES 1-64 ABOVE (OTHER THAN TOTALS HAVING CODE NUMBERS BEGINNING WITH 32) APPEARS IN THE FLOW OF FUNDS TABLE OF FLOWS FOR EITHER THE U.S. GOVERNMENT SECTOR OR THE MONETARY AUTHORITY SECTOR, EXCEPT FOR 713061713 AND 713061705 IN LINES 9 AND 35. THEIR SUM APPEARS IN THE MONETARY AUTHORITY SECTOR TABLE AS THE ASSET ITEM "AGENCY ISSUES" 713061703.

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1963	1964	1965	1966	1967	1968	CODE		
1	2.979	3.225	1.918	4.594	692	8.068	324090035	TOTAL FINANCIAL ASSETS	1
2	-659	239	-1.264	-280	165	-910	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	-386	572	-1.400	-86	993	-1.680	313020001	DEMAND DEPOSITS & CURRENCY	3
4	264	345	-158	164	875	-1.069	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	-9	12	-22	-30	47	101	313031003	TIME DEPOSITS	5
6	-6	125	-60	77	-32	47	713068001	F.R. LOANS TO MEMBER BANKS	6
7	3.945	3.085	4.396	5.569	602	7.732	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	29	-17	33	1.310	-88	134	313061703	SPONS.AGCY.ISSUES--TREAS.	8
9	-	-	-	-	-	-	713061713	SPONS.AGCY.ISSUES--F.R.	9
10	-405	-47	-17	978	993	1.437	313065005	MORTGAGES	10
11	1.925	2.893	2.864	2.770	3.749	3.662	313069005	OTHER LOANS	11
12	1.775	261	1.288	-1.365	-5.121	1.269	313078005	TAXES RECEIVABLE	12
13	485	244	388	1.249	1.468	575	313070003	TRADE CREDIT	13
14	46	24	234	899	683	416	313112003	- TREAS. CURR. & SDR CTFS.	14
15	11	-173	170	742	467	167	713012003	TREAS. CURR. & SDR CTFS.	15
16	-303	6	-358	262	-27	999	713022000	F.R. FLOAT	16
17	52	-68	93	6	-29	-106	713069603	ACCEPTANCES	17
18	31	-2	11	-41	-	-	713068103	LOANS ON GOLD TO R.O.W.	18
19	451	4	66	358	-148	-224	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	-60	8	92	199	21	235	713093005	MISC. ASSETS OF F.R.	20
21	-301	-224	-1.154	-772	-43	799	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	20	-195	103	-232	399	2.036	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	-397	24	-1.325	-336	-451	-1.156	713011005	GOLD & FOREIGN EXCHANGE	23
24	-76	53	-68	204	-9	81	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	3.962	7.028	2.483	5.820	14.083	16.765	324190035	TOTAL LIABILITIES	25
26	1.947	2.728	2.840	3.954	3.802	4.562	324100035	HIGH-POWERED MONEY	26
27	-405	801	403	1.347	1.298	767	713113001	MEMBER BANK RESERVE DEP.	27
28	-260	273	319	599	481	1.264	723025001	VAULT CASH OF COML. BANKS	28
29	2.612	1.654	2.118	2.008	2.023	2.531	713125001	CURR. OUTSIDE COML. BANKS	29
30	723	2.947	-1.806	506	8.886	10.881	324130035	U.S. GOVERNMENT DEBT	30
31	1.181	911	635	554	970	647	313133000	SAVINGS BONDS	31
32	2.901	4.433	662	1.782	7.938	9.827	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	2.773	3.451	3.724	3.514	4.830	3.825	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	-109	885	467	1.293	4.092	3.094	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	-	-	34	4	-38	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	-99	-203	507	669	569	-1	313170005	TRADE DEBT	36
37	-289	-340	-60	-361	64	723	313190005	MISC. U.S.G. LIABILITIES	37
38	-89	712	-293	117	87	378	713190005	MISC. F.R. LIABILITIES	38
39	1.292	1.353	1.449	1.360	1.395	1.322	313154005	LIFE & RETIREMENT RESERVES	39
40	-983	-3.803	-565	-1.226	-13.391	-8.697	325000535	FINANCIAL N.W. USG & MA	40
41	-1.038	-3.336	-591	-1.244	-13.419	-8.718	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	55	-467	26	18	28	21	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

CONTINUED
ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1963	1964	1965	1966	1967	1968	CODE		
43	114.415	114.913	124.337	141.843	150.496	174.739	316010005	U.S. GOVT. RECEIPTS, N.I.A.	43
44	114.159	118.182	123.807	143.632	163.676	180.563	316900005	U.S.GOVT. EXPENDITURES, N.I.A.	44
45	64.631	65.218	67.268	78.833	90.924	98.019	316901001	GOODS & SERVICES	45
46	7.309	7.983	8.380	9.160	9.840	11.390	316132001	NET INTEREST	46
47	42.219	44.981	48.159	55.639	62.912	71.154	316400205	TRANSFERS, ETC.	47
48	256	-3.269	530	-1.789	-13.180	-5.824	316061105	U.S. GOVT. SURPLUS, N.I.A.	48
49	1.292	1.353	1.449	1.360	1.395	1.322	313154005	LIFE & RETIREMENT RESERVES	49
50	-	-	-	-	-	1.330	105030003	- MINERAL RIGHTS SALES	50
51	2	-1.286	-328	-1.905	-1.156	2.902	317005005	N.I.A.-F.O.F. DISCREPANCY	51
52	-1.038	-3.336	-591	-1.244	-13.419	-8.718	315000005	FINANCIAL N.W. U.S. GOVT.	52
53	-983	-3.803	-565	-1.226	-13.391	-8.697	325000535	FINANCIAL N.W., USG & MA	53
54	55	-467	26	18	28	21	715000005	- FINANCIAL N.W., MON. AUTH.	54
55	256	-3.269	530	-1.789	-13.180	-5.824	316061105	U.S. GOVT. SURPLUS, N.I.A.	55
56	-659	239	-1.264	-280	165	-510	324000005	DEPOSITS AT COML. BANKS	56
57	-6	125	-60	77	-32	47	713068001	F.R. LOANS TO MEMBER BANKS	57
58	3.945	3.085	4.396	5.569	602	7.732	324030035	LOANS EXCEPT TO MEMBER BANKS	58
59	-301	-224	-1.154	-772	-43	799	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	59
60	1.947	2.728	2.840	3.954	3.802	4.562	324100035	- HIGH-POWERED MONEY	60
61	723	2.947	-1.806	506	8.886	10.881	324130035	- U.S. GOVERNMENT DEBT	61
62	-	-	-	-	-	1.330	105030003	- MINERAL RIGHTS SALES	62
63	55	-467	26	18	28	21	715000005	- FINANCIAL N.W., MON. AUTH.	63
64	2	-1.286	-328	-1.905	-1.156	2.902	317005005	N.I.A.-F.O.F. DISCREPANCY	64

MEMORANDUM:

EACH LINE IN LINES 1-64 ABOVE (OTHER THAN TOTALS HAVING CODE NUMBERS BEGINNING WITH 32) APPEARS IN THE FLOW OF FUNDS TABLE OF FLOWS FOR EITHER THE U.S. GOVERNMENT SECTOR OR THE MONETARY AUTHORITY SECTOR, EXCEPT FOR 713061713 AND 713061705 IN LINES 9 AND 35. THEIR SUM APPEARS IN THE MONETARY AUTHORITY SECTOR TABLE AS THE ASSET ITEM "AGENCY ISSUES" 713061703.

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1969	1970	1971	1972	1973	1974	CODE		
1	2.537	582	2.728	2.136	2.862	11.403	326090035	TOTAL FINANCIAL ASSETS	1
2	415	3.086	2.470	215	-1.516	-4.939	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	1.143	2.452	3.310	-977	-1.847	-4.338	313020001	DEMAND DEPOSITS & CURRENCY	3
4	571	-382	897	-1.106	-498	439	713123101	- TREAS.,CASH & F.R. DEPOSITS	4
5	-157	252	57	86	-167	38	313031003	TIME DEPOSITS	5
6	-5	152	-296	1.942	-723	-959	713068001	F.R. LOANS TO MEMBER BANKS	6
7	773	657	3.738	625	5.241	16.090	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	-1.297	-97	18	-17	-2	2.502	313061703	SPONS.AGCY.ISSUES—TREAS.	8
9	-	-	553	601	523	2.951	713061713	SPONS.AGCY.ISSUES—F.R.	9
10	970	302	-380	-683	-599	1.422	313065005	MORTGAGES	10
11	3.464	2.584	3.179	2.538	3.418	5.893	313069005	OTHER LOANS	11
12	-2.992	-2.591	1.542	-749	1.316	571	313078005	TAXES RECEIVABLE	12
13	919	-777	-1.704	-819	274	998	313070003	TRADE CREDIT	13
14	272	622	490	533	422	445	313112003	- TREAS. CURR. & SDR CTFS.	14
15	53	741	478	686	403	537	713012003	TREAS. CURR. & SDR CTFS.	15
16	-42	821	82	-369	-875	-1.098	713022000	F.R. FLOAT	16
17	6	-7	204	-155	-38	931	713069603	ACCEPTANCES	17
18	-	-	-	-	-	-	713068103	LOANS ON GOLD TO R.O.W.	18
19	94	253	71	108	949	-3	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	-130	90	185	17	294	1.831	713093005	MISC. ASSETS OF F.R.	20
21	1.354	-3.313	-3.184	-646	-140	1.211	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	1.351	-1.985	-2.224	-371	-19	1.354	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	-97	-1.359	-841	-371	-190	80	713011005	GOLD & FOREIGN EXCHANGE	23
24	-100	-31	119	-96	-69	223	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	-3.492	15.085	27.374	21.582	10.158	17.309	324190035	TOTAL LIABILITIES	25
26	3.149	5.273	7.524	3.396	7.394	6.029	324100035	HIGH-POWERED MONEY	26
27	226	2.065	3.638	-2.141	1.413	-1.217	713113001	MEMBER BANK RESERVE DEP.	27
28	115	-273	494	1.125	2.040	952	723025001	VAULT CASH OF COML. BANKS	28
29	2.808	3.481	3.392	4.412	3.941	6.294	713125001	CURR. OUTSIDE COML. BANKS	29
30	-8.226	7.325	16.936	15.041	454	8.426	324130035	U.S. GOVERNMENT DEBT	30
31	-96	319	2.327	3.251	2.687	2.984	313133000	SAVINGS BONDS	31
32	-1.183	12.565	23.693	11.011	5.220	9.043	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	4.217	4.988	8.076	-312	8.610	1.985	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	-2.385	-1.033	-1.122	813	359	-236	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	-	33	137	132	283	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	-328	-582	-675	-120	116	-810	313170005	TRADE DEBT	36
37	-359	539	828	30	-363	-7	313190005	MISC. U.S.G. LIABILITIES	37
38	342	505	-6	-119	1.177	-280	713190005	MISC. F.R. LIABILITIES	38
39	1.585	2.487	2.914	3.145	2.310	2.854	313154005	LIFE & RETIREMENT RESERVES	39
40	6.029	-14.503	-24.646	-19.446	-7.296	-5.906	325000535	FINANCIAL N.W. USG & MA	40
41	5.989	-14.524	-24.586	-19.547	-7.428	-6.036	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	40	21	-60	101	132	130	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

CONTINUED
ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

	1969	1970	1971	1972	1973	1974	CODE		
43	196.984	192.058	198.648	227.471	258.286	288.612	316010005	U.S. GOVT. RECEIPTS, N.I.A.	43
44	188.443	204.194	220.607	244.734	264.997	299.333	316900005	U.S.GOVT. EXPENDITURES, N.I.A.	44
45	97.461	95.642	96.220	102.126	102.188	111.121	316901001	GOODS & SERVICES	45
46	12.853	14.256	13.974	14.552	18.202	20.874	316132001	NET INTEREST	46
47	78.129	94.296	110.413	128.056	144.607	167.338	316400205	TRANSFERS, ETC.	47
48	8.541	-12.136	-21.959	-17.263	-6.711	-10.721	316061105	U.S. GOVT. SURPLUS, N.I.A.	48
49	1.585	2.487	2.914	3.145	2.310	2.854	313154005	LIFE & RETIREMENT RESERVES	49
50	44	329	717	912	3.168	6.490	105030003	- MINERAL RIGHTS SALES	50
51	1.011	230	430	51	1.575	-1.049	317005005	N.I.A.-F.O.F. DISCREPANCY	51
52	5.989	-14.524	-24.586	-19.547	-7.428	-6.036	315000005	FINANCIAL N.W., U.S. GOVT.	52
53	6.029	-14.503	-24.646	-19.446	-7.296	-5.906	325000535	FINANCIAL N.W., USG & MA	53
54	40	21	-60	101	132	130	715000005	- FINANCIAL N.W., MON. AUTH.	54
55	8.541	-12.136	-21.959	-17.263	-6.711	-10.721	316061105	U.S. GOVT. SURPLUS, N.I.A.	55
56	415	3.086	2.470	215	-1.516	-4.939	324000005	DEPOSITS AT COML. BANKS	56
57	-5	152	-296	1.962	-723	-959	713068001	F.R. LOANS TO MEMBER BANKS	57
58	773	657	3.738	625	5.241	16.090	324030035	LOANS EXCEPT TO MEMBER BANKS	58
59	1.354	-3.313	-3.184	-646	-140	1.211	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	59
60	3.149	5.273	7.524	3.396	7.394	6.029	324100035	- HIGH-POWERED MONEY	60
61	-8.226	7.325	16.936	15.041	454	8.426	324130035	- U.S. GOVERNMENT DEBT	61
62	44	329	717	912	3.168	6.490	105030003	- MINERAL RIGHTS SALES	62
63	40	21	-60	101	132	130	715000005	- FINANCIAL N.W., MON. AUTH.	63
64	1.011	230	430	51	1.575	-1.049	317005005	N.I.A.-F.O.F. DISCREPANCY	64

MEMORANDUM:

EACH LINE IN LINES 1-64 ABOVE (OTHER THAN TOTALS HAVING CODE NUMBERS BEGINNING WITH 32) APPEARS IN THE FLOW OF FUNDS TABLE OF FLOWS FOR EITHER THE U.S. GOVERNMENT SECTOR OR THE MONETARY AUTHORITY SECTOR, EXCEPT FOR 713061713 AND 713061705 IN LINES 9 AND 35. THEIR SUM APPEARS IN THE MONETARY AUTHORITY SECTOR TABLE AS THE ASSET ITEM "AGENCY ISSUES" 713061703.

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1975	1976	1977	1978	1979	1948-60	CODE		
1	15,753	18,640	16,318	37,000	30,594	22,360	324090035	TOTAL FINANCIAL ASSETS	1
2	-1,479	1,062	2,981	7,158	490	4,987	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	2,896	3,988	-513	4,024	559	3,492	313020001	DEMAND DEPOSITS & CURRENCY	3
4	4,470	3,085	-3,347	-3,070	134	-1,344	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	95	159	147	64	65	151	313031003	TIME DEPOSITS	5
6	-70	-204	240	907	282	-9	713068001	F.R. LOANS TO MEMBER BANKS	6
7	16,709	15,416	12,826	29,979	30,400	21,622	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	4,504	3,738	5,345	7,730	8,225	37	313061703	SPONS.AGCY.ISSUES—TREAS.	8
9	995	778	1,464	-352	735	-	713061713	SPONS.AGCY.ISSUES—F.R.	9
10	3,224	-3,062	-230	-371	1,036	4,823	313065005	MORTGAGES	10
11	7,357	8,236	6,716	13,048	13,292	7,957	313069005	OTHER LOANS	11
12	-3,101	5,537	-1,283	3,540	3,696	2,109	313078005	TAXES RECEIVABLE	12
13	1,190	453	-762	2,726	1,944	1,790	313070003	TRADE CREDIT	13
14	937	1,189	300	524	1,610	278	313112003	- TREAS. CURR. & SDR CTFS.	14
15	959	1,398	571	565	1,737	836	713012003	TREAS. CURR. & SDR CTFS.	15
16	1,687	-1,087	1,209	2,706	251	1,333	713022000	F.R. FLOAT	16
17	127	-135	-37	-367	117	74	713069603	ACCEPTANCES	17
18	-	-	-	-	-	-44	713068103	LOANS ON GOLD TO R.O.W.	18
19	683	955	717	749	800	2,818	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	21	-206	-584	529	177	167	713093005	MISC. ASSETS OF F.R.	20
21	593	2,366	271	-1,044	-578	-4,240	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	470	2,441	271	-2,634	-1,195	363	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	84	88	-29	1,646	728	-4,809	713011005	GOLD & FOREIGN EXCHANGE	23
24	-39	163	-29	56	111	-206	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	89,073	76,402	70,144	70,970	48,147	25,391	324190035	TOTAL LIABILITIES	25
26	7,013	6,276	11,806	15,187	9,524	3,184	324100035	HIGH-POWERED MONEY	26
27	209	-894	1,712	4,353	-1,431	-818	713113001	MEMBER BANK RESERVE DEP.	27
28	612	-131	1,801	1,548	3,018	1,130	723025001	VAULT CASH OF COML. BANKS	28
29	6,192	7,301	8,293	9,286	7,937	2,872	713125001	CURR. OUTSIDE COML. BANKS	29
30	78,264	65,387	51,689	48,560	30,320	11,150	324130035	U.S. GOVERNMENT DEBT	30
31	4,025	4,655	4,744	3,929	-815	-594	313133000	SAVINGS BONDS	31
32	81,823	64,484	52,905	51,184	39,576	14,194	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	7,433	9,087	5,798	7,743	6,896	4,825	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	-443	-112	-886	-1,432	-1,401	1,872	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-18	104	-81	-74	-55	-	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	1,445	4,361	1,670	2,374	402	3,145	313170005	TRADE DEBT	36
37	-709	939	-925	-276	-1,310	-3,108	313190005	MISC. U.S.G. LIABILITIES	37
38	-462	251	-102	450	709	466	713190005	MISC. F.R. LIABILITIES	38
39	3,796	4,739	6,649	7,223	8,303	11,057	313154005	LIFE & RETIREMENT RESERVES	39
40	-73,320	-57,762	-53,826	-33,970	-17,553	-3,031	325000535	FINANCIAL N.W. USG & MA	40
41	-73,556	-57,810	-54,049	-34,650	-17,943	-3,304	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	236	48	223	680	390	273	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

CONTINUED
ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

	1975	1976	1977	1978	1979	1948-60	CODE		
43	286.241	331.421	375.384	432.066	497.588	894.402	316010005	U.S. GOVT. RECEIPTS, N.I.A.	43
44	356.825	385.016	421.715	459.751	509.038	885.461	316900005	U.S.GOVT. EXPENDITURES, N.I.A.	44
45	123.058	129.707	144.379	152.590	166.649	533.810	316901001	GOODS & SERVICES	45
46	23.199	26.754	28.983	34.816	43.072	64.234	316132001	NET INTEREST	46
47	210.568	228.555	248.353	272.345	299.317	267.417	316400205	TRANSFERS, ETC.	47
48	-70.584	-53.595	-46.331	-27.685	-11.450	8.941	316061105	U.S. GOVT. SURPLUS, N.I.A.	48
49	3.796	4.739	6.649	7.223	8.303	11.057	313154005	LIFE & RETIREMENT RESERVES	49
50	1.323	3.973	2.470	1.973	4.745	-	105030003	- MINERAL RIGHTS SALES	50
51	499	3.449	3.539	1.715	2.935	1.188	317005005	N.I.A.-F.O.F. DISCREPANCY	51
52	-73.556	-57.810	-54.049	-34.650	-17.963	-3.304	315000005	FINANCIAL N.W., U.S. GOVT.	52
53	-73.320	-57.762	-53.826	-33.970	-17.553	-3.031	325000535	FINANCIAL N.W., USG & MA	53
54	236	48	223	680	390	273	715000005	- FINANCIAL N.W., MON. AUTH.	54
55	-70.584	-53.595	-46.331	-27.685	-11.450	8.941	316061105	U.S. GOVT. SURPLUS, N.I.A.	55
56	-1.479	1.062	2.981	7.158	490	4.987	324000005	DEPOSITS AT COML. BANKS	56
57	-70	-204	240	907	282	-9	713068001	F.R. LOANS TO MEMBER BANKS	57
58	16.709	15.416	12.826	29.979	30.400	21.622	324030035	LOANS EXCEPT TO MEMBER BANKS	58
59	593	2.366	271	-1.044	-578	-9.240	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	59
60	7.013	6.276	11.806	15.187	9.524	3.184	324100035	- HIGH-POWERED MONEY	60
61	78.266	65.387	51.689	48.560	30.320	11.150	324130035	- U.S. GOVERNMENT DEBT	61
62	1.323	3.973	2.470	1.973	4.745	-	105030003	- MINERAL RIGHTS SALES	62
63	236	48	223	680	390	273	715000005	- FINANCIAL N.W., MON. AUTH.	63
64	499	3.449	3.539	1.715	2.935	1.188	317005005	N.I.A.-F.O.F. DISCREPANCY	64

MEMORANDUM:

EACH LINE IN LINES 1-64 ABOVE (OTHER THAN TOTALS HAVING CODE NUMBERS BEGINNING WITH 32) APPEARS IN THE FLOW OF FUNDS TABLE OF FLOWS FOR EITHER THE U.S. GOVERNMENT SECTOR OR THE MONETARY AUTHORITY SECTOR, EXCEPT FOR 713061713 AND 713061705 IN LINES 9 AND 35. THEIR SUM APPEARS IN THE MONETARY AUTHORITY SECTOR TABLE AS THE ASSET ITEM "AGENCY ISSUES" 713061703.

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1961-65	1966-74	1975-79	1966-79	1948-79	CODE		
1	13.688	35.602	118.305	153.907	189.955	324090035	TOTAL FINANCIAL ASSETS	1
2	-830	-894	10.212	9.318	13.475	324000005	DEPOSITS AT COMMERCIAL BANKS	2
3	-252	-1.230	10.954	9.724	12.964	313020001	DEMAND DEPOSITS & CURRENCY	3
4	566	-109	1.272	1.163	385	713123101	- TREAS.CASH & F.R. DEPOSITS	4
5	-12	227	530	757	896	313011003	TIME DEPOSITS	5
6	71	203	1.155	1.358	1.420	713068001	F.R. LOANS TO MEMBER BANKS	6
7	18.331	41.027	105.330	146.357	186.310	324030035	LOANS EXCEPT TO MEMBER BANKS	7
8	8	2.463	29.542	32.005	32.050	313061703	SPONS.AGCY.ISSUES—TREAS.	8
9	-	4.628	3.620	8.248	8.248	713061713	SPONS.AGCY.ISSUES—F.R.	9
10	53	4.440	597	5.037	9.913	313065005	MORTGAGES	10
11	10.807	31.257	48.649	79.906	98.670	313069005	OTHER LOANS	11
12	4.346	-8.120	8.389	269	6.724	313078005	TAXES RECEIVABLE	12
13	1.332	2.183	5.551	7.734	10.856	313070003	TRADE CREDIT	13
14	378	4.782	4.560	9.342	9.998	313112003	- TREAS. CURR. & SDR CTFS.	14
15	177	4.234	5.230	9.464	10.477	713012003	TREAS. CURR. & SDR CTFS.	15
16	401	-247	4.766	4.519	6.253	713022000	F.R. FLOAT	16
17	113	812	-295	517	704	713069603	ACCEPTANCES	17
18	33	-41	-	-41	-52	713068103	LOANS ON GOLD TO R.O.W.	18
19	1.306	1.458	3.904	5.362	9.486	313090005	MISC. ASSETS OF U.S. GOVT.	19
20	133	2.742	-63	2.679	2.979	713093005	MISC. ASSETS OF F.R.	20
21	-3.884	-4.734	1.608	-3.126	-11.250	323011095	GOLD, SDR'S & OFF.FGN. EXCH.	21
22	-556	309	-647	-338	-531	313011005	GOLD,SDR'S & OFF.FGN.EXCH.	22
23	-3.353	-4.721	2.517	-2.204	-10.366	713011005	GOLD & FOREIGN EXCHANGE	23
24	-25	322	262	584	353	713122605	- FGN. DEPOSITS EXCL. I.M.F.	24
25	29.455	124.684	354.736	479.420	534.266	324190035	TOTAL LIABILITIES	25
26	10.358	45.083	49.806	94.889	108.431	324100035	HIGH-POWERED MONEY	26
27	1.172	7.396	3.949	11.345	11.699	713113001	MEMBER BANK RESERVE DEP.	27
28	1.505	6.797	6.848	13.645	16.280	723025001	VAULT CASH OF COML. BANKS	28
29	7.681	30.890	39.009	69.899	80.452	713125001	CURR. OUTSIDE COML. BANKS	29
30	12.876	60.229	274.220	334.449	358.475	324130035	U.S. GOVERNMENT DEBT	30
31	4.053	13.643	16.538	30.181	33.640	313133000	SAVINGS BONDS	31
32	19.532	79.896	289.972	369.868	403.594	313161105	DIRECT & GUAR.TREAS. SECS.	32
33	13.384	39.733	36.957	76.690	94.899	713061101	- F.R. HOLDINGS DIR. & GUAR.	33
34	2.575	4.875	-4.274	601	5.048	313161755	BUDG.AGCY.ISS.,MTGS.& L.P.	34
35	-	585	-124	461	461	713061705	- F.R. HOLDINGS B.A.I.& L.P.	35
36	721	-1.162	10.252	9.090	12.956	313170005	TRADE DEBT	36
37	-954	1.094	-2.281	-1.187	-5.249	313190005	MISC. U.S.G. LIABILITIES	37
38	333	2.201	846	3.047	3.846	713190005	MISC. F.R. LIABILITIES	38
39	6.221	19.372	30.710	50.082	67.360	313154005	LIFE & RETIREMENT RESERVES	39
40	-15.767	-89.082	-236.431	-325.513	-344.311	325000535	FINANCIAL N.W. USG & MA	40
41	-15.494	-89.513	-238.008	-327.521	-346.319	315000005	FINANCIAL N.W., U.S. GOVT.	41
42	-273	431	1.577	2.008	2.008	715000005	FINANCIAL N.W., MON. AUTH.	42

Table A.2—Continued

11 JUNE 1980
ANNUAL FLOWS, 1946-79

CONTINUED
ANNUAL FLOWS, 1946-79

SECTOR STATEMENT OF SAVING & INVESTMENT, U.S. GOVERNMENT & MONETARY AUTHORITY

BILLIONS OF DOLLARS PER YEAR

BILLIONS OF DOLLARS PER YEAR

	1961-65	1966-74	1975-79	1966-79	1948-79	CODE		
43	557.910	1829.137	1922.700	3751.837	5204.149	316010005	U.S. GOVT. RECEIPTS, N.I.A.	43
44	568.526	1910.179	2132.345	4042.524	5496.511	316900005	U.S.GOVT. EXPENDITURES, N.I.A.	44
45	318.225	872.534	716.383	1588.917	2460.952	316901001	GOODS & SERVICES	45
46	36.678	125.101	156.824	281.925	382.837	316132001	NET INTEREST	46
47	213.623	912.544	1259.138	2171.682	2652.722	316400205	TRANSFERS, ETC.	47
48	-10.616	-81.042	-209.645	-290.687	-292.362	316061105	U.S. GOVT. SURPLUS, N.I.A.	48
49	6.221	19.372	30.710	50.082	67.360	313154005	LIFE & RETIREMENT RESERVES	49
50	-	12.990	14.484	27.474	27.474	105030003	- MINERAL RIGHTS SALES	50
51	-1.343	2.089	12.137	14.226	14.071	317005005	N.I.A.-F.O.F. DISCREPANCY	51
52	-15.496	-89.513	-238.008	-327.521	-346.319	315000005	FINANCIAL N.W.: U.S. GOVT.	52
53	-15.767	-89.082	-236.431	-325.513	-344.311	325000535	FINANCIAL N.W., USG & MA	53
54	-273	431	1.577	2.008	2.008	715000005	- FINANCIAL N.W.: MON. AUTH.	54
55	-10.616	-81.042	-209.645	-290.687	-292.362	316061105	U.S. GOVT. SURPLUS, N.I.A.	55
56	-830	-894	10.212	9.318	13.475	324000005	DEPOSITS AT COML. BANKS	56
57	71	203	1.155	1.358	1.420	713068001	F.R. LOANS TO MEMBER BANKS	57
58	18.331	41.027	105.330	146.357	186.310	324030035	LOANS EXCEPT TO MEMBER BANKS	58
59	-3.884	-4.734	1.608	-3.126	-11.250	323011095	GOLD, SDR'S & OFF.FGN.EXCH.	59
60	10.358	45.083	49.806	94.889	108.431	324100035	- HIGH-POWERED MONEY	60
61	12.876	60.229	274.220	334.449	358.475	324130035	- U.S. GOVERNMENT DEBT	61
62	-	12.990	14.484	27.474	27.474	105030003	- MINERAL RIGHTS SALES	62
63	-273	431	1.577	2.008	2.008	715000005	- FINANCIAL N.W.: MON. AUTH.	63
64	-1.343	2.089	12.137	14.226	14.071	317005005	N.I.A.-F.O.F. DISCREPANCY	64

MEMORANDUM:

EACH LINE IN LINES 1-64 ABOVE (OTHER THAN TOTALS HAVING CODE NUMBERS BEGINNING WITH 32) APPEARS IN THE FLOW OF FUNDS TABLE OF FLOWS FOR EITHER THE U.S. GOVERNMENT SECTOR OR THE MONETARY AUTHORITY SECTOR, EXCEPT FOR 713061713 AND 713061705 IN LINES 9 AND 35. THEIR SUM APPEARS IN THE MONETARY AUTHORITY SECTOR TABLE AS THE ASSET ITEM "AGENCY ISSUES" 713061703.

A Supplementary Note on Debt Management

In this note we mention some aspects of Federal debt management that would be treated in any thorough account of the subject, though some of them are not central to the subject of this paper.

Debt management is carried out by the Treasury subject to legislation enacted by the Congress. It is concerned with such matters as the following.

What should be the term structure of the Federal debt? That is, how much should be in 13-week bills, how much in long-term bonds, and how much in intermediate maturities? The average term to maturity of the Federal debt is now rather short. Very short-term issues are regarded by the public as relatively close substitutes for money since the value of a short-term instrument fluctuates only insignificantly as market interest rates fluctuate. Long-term bonds are poor substitutes for money because their values do fluctuate (in reverse) as market interest rates change. Open market operations in long-term bonds have a greater impact than those in short-term bills because the securities being exchanged for money are less like money.

What interest rates should be offered by the Treasury? Here the answer is simple, for the Treasury must offer rates comparable to the going market rates for similar private securities or it will find no private takers. (At times like the present, when discriminatory Federal interest ceilings deny to small savers the right to receive yields as high as the market is paying, the Treasury may possibly be able to sell some of its small-denomination U.S. Savings Bonds to small savers, but one hopes that such interest ceilings are not long for this world.)

In what denominations should Federal securities be offered? In recent years the Treasury has increased the minimum size of those securities whose interest rates are market-determined (such as Treasury bills: their minimum denomination was raised a few years ago from $1,000 to $10,000). The only small denominations now offered carry interest rates considerably below going market rates. It is not very important whether the Treasury offers its own securities in small denominations for small savers, so long as private financial institutions are permitted to accept small amounts of savings from individuals. What is important, in fairness, is that small savers not be denied access to market yields because of discriminatory government regulations as at present.

What kind of commitment to pay interest and principal should be offered? Currently, almost all U.S. Government debt carries the promise to pay in dollars, regardless of what the purchasing power of those dollars may be when the payment is due. It would be possible to promise to pay in dollars of constant purchasing power according to some price index, in gold, or in some foreign currency such as German marks. When a country's currency has been stable in purchasing power in the past, and is expected to remain so, promises to pay interest and principal in that currency are quite satisfactory. However, when the future inflation rate is uncertain, a long-term promise to pay in dollars is a very risky thing: it will turn out very valuable if inflation is stopped dead the day after the promise is made, but nearly worthless if the inflation rate rises much further than expected. In inflationary uncertainty, many lenders might prefer a promise in terms of indexed dollars or gold in order to protect themselves from this uncertainty. A difficulty with such promises is that governments have caused them to be broken before and might do so again. The gold clause in certain contracts was abrogated by the courts after the U.S. abandoned the gold standard in the thirties.

A crucial related question has to do with the tax treatment of interest and principal payments. During an inflationary period, the interest rates agreed upon in the marketplace carry an inflation premium to allow for the decline in purchasing power of the dollar that is expected to occur during the life of the loan. For example, if borrower and lender agree that the expected inflation rate for the next year will be 10 percent and that a real interest rate of 3 percent is appropriate, then they will agree on an interest rate of 13.3 percent for a one-year loan to be repaid in dollars ($1.10 \times 1.03 = 1.133$, which requires an interest rate of $0.133 = 13.3$ percent). Under present U.S. tax law, written for an era of stable prices, the entire 13.3 percent is regarded as income and is taxed at the lender's marginal tax rate. But this amounts in fact to a confiscation of part of his original capital. If he received 10 percent interest during a 10 percent inflation, he would have no income at all in terms of real purchasing power. If he receives 13.3 percent interest, then only the 3 percent real return should be regarded as income and taxed. Under present tax law, it is virtually impossible for the Treasury to offer interest rates that will protect lenders against future inflation. Inflation plus taxation of nominal interest and dividends and capital gains equal confiscation of capital.

The remaining items of debt management to be mentioned are rather minor and technical. Should interest on Federal securities be paid periodically during their life, or should it be accumulated and paid at maturity? Answer: Whatever lenders prefer. There is no harm in offering a variety of securities. Should Federal securities be sold at auction, as Treasury bills are, or through an offering of a stated amount of securities at a fixed interest rate? Answer: The auction method works well where the Treasury wants to be sure in advance how much money it will raise through the sale of the issue. Offerings at fixed interest rates work well where that advance certainty is not important. Should Federal securties be negotiable (as most current issues are), or should they be redeemable only by the original buyer (or his or her heirs)? Answer: Negotiability is important to most lenders, and accordingly the Treasury can borrow at slightly lower rates if it issues negotiable securities. This, it should do.

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STABILIZATION POLICY IN THE OPEN ECONOMY

By Rudiger Dornbusch*

CONTENTS

I. Introduction

This paper discusses stabilization policy in the open economy. The emphasis is to set out the channels through which the openness of the economy affects the manner in which monetary and fiscal policies, as well as domestic or foreign disturbances, work themselves out in the economy. The analysis that emerges attaches an important role to openness in qualifying standard thinking on stabilization policy.

The qualifications to conventional thinking arise in a number of respects. First, external balance is an objective of policy—or at least a constraint whether the subject is balance of payments equilibrium, the current balance or the basic balance. Second, policy moves impinge through the openness of the economy on the exchange rate and the current account and thus affect aggregate demand or price trend targets. Third, there is an important distinction between short-run accommodating policy that is appropriate to transitory disturbances and policies conducive to adjustment which is required in the case of structural change. The paper devotes considerable attention to the idea of long-term adjustment through changes in competitiveness because, in discussions of stabilization policy, aggregate demand problems appear transitory or cyclical. In an open economy perspective, however, it is entirely possible that there is an adverse secular demand shift due to a loss of competitive advantage that is not offset by innovation in products or techniques. Here adjustment through a change in the real exchange rate is required, an adjustment that policymakers find hard to understand and even harder to swallow.

The paper is organized in four parts. Part II is a review of various facets of the openness of the U.S. economy. This section highlights "openness" as a real life issue in the U.S. economy. It shows that the target and instrument variables of stabilization policy are quite tightly linked internationally. This, of course, implies that the proper analytical framework for the study of stabilization policy is one of an open economy.

Part III, the main body of the paper, develops a series of open economy models that focus on the channels through which policies

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operate taking into account international linkages. The analysis distinguishes fixed and flexible rates, the role of short-term capital flows and the importance of real adjustments to cope with structural payments imbalance. The analysis in this section is perforce quite technical and goes decidedly beyond the textbook level in isolating critical linkages and effects. Included are a discussion of expectations, the question of medium term real wage rigidity on the supply side as a limitation to the effectiveness of exchange rate changes and the issue of long-term borrowing and lending as an adjustment process.

Part IV offers perspective on the theoretical models. The argument here is that stabilization policy under flexible rates with highly informed expectations becomes a difficult task because the inflation unemployment trade-off is significantly worsened. The U.S. stabilization policy should increasingly give way to a framework that emphasizes adjustment policy and that looks at real exchange rate changes as a more significant and positive policy tool.

II. The U.S. in the World Economy

This part presents some evidence of the integration of the U.S. in the world economy. It also focuses on the extent and role of openness of the economy. Such a perspective is important to prepare for an appreciation of the importance that openness plays in the conduct of macroeconomic policies. In particular the paper wants to draw attention to the extent of integration in goods and assets markets as evidenced by the tight linkage between financial markets and the substantial linkages in output and price movements. The U.S. economy figures as a large player in the world market but it is also true, and increasingly, that foreign disturbances, or disturbances originating in the external sector, play an important part in the domestic macroeconomic scene. These considerations suggest the dimensions of that openness.

1. Trade

One of the most visible aspects of openness is the U.S. external trade patterns and position in world trade. A first measure of the role of trade is the contribution of net exports to the growth of Gross National Product. Table 1 shows the growth rate of GNP and the change in net exports expressed as a fraction of the GNP, both measured in real terms. The table reveals that changes in net exports are quite sizable even by comparison with GNP growth.

TABLE 1

	Percent change in GNP	Change in net exports as percent of GNP
1960–70 average	3.6	0.3
1971	3.0	−.2
1972	5.6	.2
1973	5.3	.9
1974	−1.4	.7
1975	−1.3	.5
1976	5.5	−.6
1977	4.7	−.5

In particular the table shows the cyclical pattern of net exports. In the recession of 1974–75, growth in net exports dampened the contraction. In the expansion of 1976–77 a sharp decline in net exports contained the expansion. The order of magnitude of the changes in net exports as a source of growth in the U.S. economy must be recognized as being invariably less than 1 percent and more nearly around one-half a percent. This suggests that the U.S. cannot expect changes in net exports to be an overridingly important source of growth or contraction, at least in the short run.

A second perspective on U.S. trade comes from a look at the commodity composition of trade as shown in table 2. The table indicates a concentration of U.S. exports in manufactures, although agricultural products remain near one-fifth of exports. On the import side, the U.S. is a substantial buyer of raw materials, including fuels. There is, also, however, an important part of imports occupied by manufactures.

TABLE 2.—THE PERCENTAGE COMPOSITION OF U.S. TRADE

	Foods, feeds, and beverages	Industrial supplies and materials	Capital goods	Consumer goods	Other
Exports:					
1970	13.8	32.5 (5.2)	43.6	6.6	3.5
1973	21.3	27.8 (3.6)	40.4	6.7	3.7
1975	18.0	27.9 (5.3)	44.2	6.1	3.8
1977	16.3	28.6 (5.0)	43.8	7.4	3.8
1978/I	17.6	27.5 (3.2)	43.8	7.4	4.2
Imports:					
1970	15.4	38.6 (8.0)	24.5	18.6	2.8
1973	12.9	39.9 (12.7)	26.7	18.3	2.1
1975	9.9	52.3 (29.1)	22.6	13.5	1.8
1977	9.3	53.4 (31.5)	21.7	14.4	1.2
1978/I	9.5	49.3 (25.7)	23.8	15.8	1.8

Notes.—The parentheses in the third column show the category fuels, lubricants, petroleum, and products. The category capital goods in the third column include automotive vehicles, parts, and engines. Data for 1978/I are seasonally adjusted. Percentages may not add to 100 percent due to rounding.

Source: "Survey of Current Business," June 1978, pt. II.

A third perspective on U.S. trade concerns our position in the world economy. We concentrate on manufactures considering their importance in our exports. Table 3 shows volume indexes for manufactures exports by all industrialized countries and by the U.S. It also shows the U.S. terms of trade for manufactures and the U.S. share in industrial countries' exports of manufactures.

Table 3 shows that U.S. exports of manufactures grew along with the exports of industrialized countries, although at a substantially lower rate, 6.2 percent versus 8.5 percent. The relative price of the U.S. manufactures has declined since 1970, reflecting largely the gain in competitiveness achieved by the repeated dollar depreciation. Our share in industrialized countries exports has declined since the 1960's—from a share of more than 20 percent in the early 1960's down to less than 15 percent. That decline reflects in part the growth of our competitors—Germany, Japan and other advanced countries—but also of the new Less Developed Country (LDC) competitors such as Brazil or Korea. The loss in export share also reflects our adverse relative price development. The declining importance of the U.S. as an exporter of manufactured goods is perhaps one of the outstanding facts in the transition from the 1960's to the 1970's. The other critical fact is the transformation of LDCs into competitive producers of manufactures. That fact is becoming increasingly apparent and will no doubt pose a major challenge for trade policy.

TABLE 3.—TRADE IN MANUFACTURES

	Volume indexes			
	Industrialized countries	United States	U.S. terms of trade	U.S. export share
1960	41	55	96.4	22.3
1965	60	70	94.4	19.1
1970	100	100	100.0	17.4
1971	108	101	97.1	16.0
1972	118	110	92.0	14.9
1973	134	135	85.0	14.8
1974	148	158	84.6	15.7
1975	141	152	87.4	16.3
1976	157	155	92.9	15.9
1977	164	153	89.5	14.5

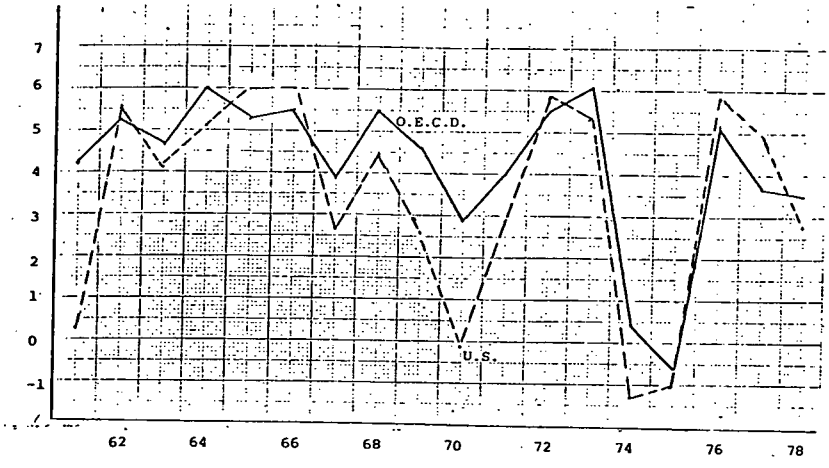
Source: "U.N. Monthly Bulletin of Statistics," September 1978.

2. Income Interdependence

The second channel through which the United States is linked to the world economy is the interdependence of income and spending. The paper presents three ways of looking at that interdependence. Chart 1 shows the growth rate of real GNP in the United States and the size-weighted growth rate for all Organizations for Economic Cooperation Development (OECD) countries. The chart reflects the high extent to which the United States and the rest of the world share their cyclical experience. Thus, for example, the United States and the OECD area at large shared the 1970 recession, they joined in the 1973 boom and they shared again the severe recession of 1974–75.

The broad pattern of correspondence in the growth rates should not conceal, however, the fact that there remain important differences not only in the trend growth rate but also in the cyclical behavior. Thus in the recovery from the 1974–1975 recession, the United States clearly chose a more rapid expansion than the OECD, causing thereby a large trade gap.

CHART 1.—Comparative real growth rates.



Source: OECD Economic Outlook, December 1978.

A second perspective on the income interdependence comes from macroeconometric models of the open economy. In these models estimates of interdependence through trade flows are used to simulate the impact of fiscal or demand expansion in one country on the income of trading partners. In table 4 we reproduce some estimates from a study by Hickman, using the LINK-model. The table shows the impact of a 1 percent demand expansion in the countries reported in the left column on the countries shown in the top row. Accordingly the table reveals that a 1 percent demand expansion in the United States raises our own income within a year by 1.18 percent. Income in Germany is raised by 0.04 percent, in Canada by .31 percent and in Japan by .13 percent.

TABLE 4.—THE TRANSMISSION OF AGGREGATE DEMAND DISTURBANCES

[Percentage change in income]

Initiating country [1]	Affected country			
	United States	Germany	Canada	Japan
United States	1.18	0.04	0.31	0.14
Germany	.04	.98	.05	.03
Canada	.08	.02	1.15	.02
Japan	.02	.01	.02	1.18

[1] (1 percent increase in autonomous spending).

Source: Bert Hickman, "International Transmission of Economic Fluctuations and Inflation," in Albert Ando, et al., "International Aspects of Stabilization Policies," Federal Reserve Bank of Boston, 1975, p. 211.

The precise estimates matter less than the broad pattern. In that perspective there is clearly an important transmission between highly integrated countries such as the U.S. and Canada. The interaction between Germany and the U.S. is considerably smaller, reflecting the fact that direct trade links are not very important. The fact of *some* transmission in this instance relies largely on indirect or third-country induced expenditures.

Modeling empirically the international macroeconomic interdependence is still in its infancy and numbers as those in table 4 need to be interpreted with caution. They are reported here mainly to point out that useful empirical estimates of international interdependence are becoming available and should increasingly become an important part of the macroeconomic stabilization policy design. Surely, disregarding the interdependence in setting macroeconomic policies would be altogether foolish.

A third perspective on income interdependence arises from trade equations. These are, of course, implicit in the simulation results of table 4 but are worth spelling out in more detail. Studies of trade equations show the impact of U.S. and foreign incomes on trade flows and, thereby, on income. The precise estimates of income elasticities vary considerably across specifications. One set of estimates is reported in table 5.[1]

[1] See Dornbusch, R. "Flexible Exchange Rates and Macroeconomic Experience: The U.S. Since 1973." A paper presented at the Tripartite Meeting, Tokyo, November 1978.

TABLE 5.—INCOME ELASTICITIES OF U.S. TRADE FLOWS

	U.S. actual output	U.S. potential output	Foreign actual output	Foreign potential output
U.S. exports			0.6	0.2
U.S. imports	0.9	1.7		

Table 5 indicates that a 1 percent increase in foreign income will raise U.S. exports by only 0.6 percent. By comparison, a rise in U.S. income will raise imports almost by the same percentage increase (0.9). Potential output also affects trade flows. Trend growth abroad leads to an increase in our exports, although only on a modest scale (0.2). Domestic potential output growth has a substantial effect on imports (1.7). The table thus reveals the much discussed Houthakker-Magee law—world demand for U.S. goods is much less income elastic than our demand for foreign goods. As an implication, if the U.S. and the rest of the world grow at the same rate there would be a growing trade gap.

The interpretation of the equations remains somewhat in doubt since it is uncertain whether there is truly an asymmetry in the income response or whether the potential output variable captures a time trend effect, namely the adverse shift in competitive advantage against the U.S. This adverse shift, already noted in discussing U.S. performance as an exporter of manufactures, would imply that over time, as technology spreads, the U.S. increasingly loses out to other industrialized countries and LDC's as a competitive producer of manufactures unless there is an offsetting gain in new techniques or products at home. The issue whether it is shifting competitive advantage or asymmetry of income elasticities that are revealed in table 5 is not an esoteric question. It is of the first order of importance in assessing the impact of stabilization policies. If it is an asymmetry in income elasticities, then U.S. expansion gives rise to a large trade gap and U.S. contraction—because of the large income elasticity of imports—is an effective tool for correcting the external balance. If, on the contrary, we are looking at a shifting of competitive advantage, then U.S. stabilization policy faces the major challenge of coping with a secular decline in demand for U.S. goods. The issue remains unsettled and, regrettably, has attracted far too little interest.

3. Financial Integration

A third area where openness is essential concerns capital markets. What evidence is there for a close linkage among capital markets? Table 6 shows the correlation of changes in real stock market returns. The real stock market is computed as a stock market index deflated by the respective countries[1a] Consumer Price Index (CPI). Monthly data for one-year percentage changes in the real value of the stock market are computed and their correlation across countries, shown in table 6, is evidence of market integration.

[1a] Ibid.

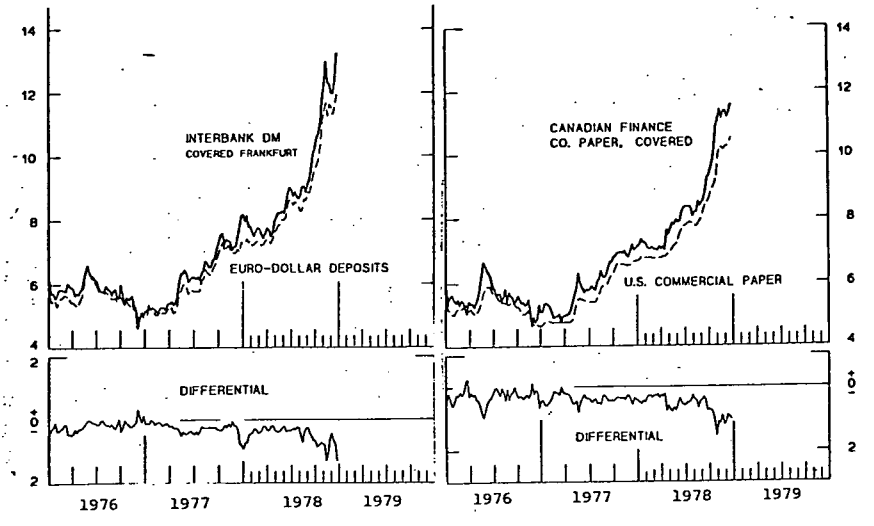
TABLE 6.—CORRELATION OF REAL STOCK MARKET CHANGES: 1970:1–1978:5

	United States	Germany	Japan	United Kingdom
United States	1.0			
Germany	.55	1.0		
Japan	.63	.63	1.0	
United Kingdom	.76	.67	.57	1.0

The table reveals a substantial positive correlation between real market returns. Interestingly, the correlation is highest for the U.S. and the UK, but it is also substantial for Germany and Japan. The integration of stock markets shown in the table thus broadly reflects the pattern of correlation of economic activity that was commented on above.

The integration of stock markets is more difficult to assess than the integration of bond markets. With highly comparable instruments investors can make a direct comparison of interest rates. A direct comparison of interest rates would of course reveal substantial international differences, with low rates prevailing in Germany and Switzerland and high rates in the U.S. and Canada. An adjustment for exchange risk is appropriate to reflect the anticipation of U.S. or Canadian depreciation. "Covered" interest differentials—with such an adjustment, equal to the percentage premium of forward foreign exchange—are shown in chart 2. It is apparent that these differentials are small. Furthermore, to the extent that they persist, they may be evidence of differential tax treatment or regulation rather than of a failure of capital markets to be quite completely integrated.

CHART 2.—Covered interest rate differentials.



Source: Board of Governors of the Federal Reserve.

4. Price Linkages

The last international linkage to be considered here is that between prices. The linkage is much harder to pin down with any precision because exchange rate movements can offset divergent trends in price levels. Nevertheless, chart 3 reveals a substantial comovement in inflation rates for the U.S. and the OECD countries. It is apparent from the chart that in the 1960's inflation rates were not only low but also diverged relatively little. With the advent of flexible exchange rates in the early 1970's a wider divergence of inflation became possible. Within the OECD, the UK and Italy experienced inflation rates in excess of 20 percent per year while Germany lowered inflation to less than 5 percent.

Should the divergence of inflation rates be interpreted as a departure from market integration? Such an interpretation would be inappropriate since it omits the fact that exchange rate movements may have largely offset divergent price trends. The appropriate comparison is one of exchange rate adjusted price trends. Table 7 shows measures of exchange rate adjusted wholesale price of manufactures comparisons for various countries:

TABLE 7.—EXCHANGE RATE ADJUSTED PRICE COMPARISONS
[1975=100]

	United States	Canada	Germany	Japan	United Kingdom
1972	106.9	103.3	94.3	100.5	107.8
1974	100.0	104.0	103.2	113.9	95.1
1976	103.1	104.8	101.6	103.8	93.9
1978/II	96.1	91.1	104.5	117.4	102.2

Source: IMF "International Financial Statistics," December 1978.

Table 7 shows that the substantial movements in nominal exchange rates have had some effect on competitiveness. Relative prices have changed as evidenced by the decline in the relative price of U.S. goods from 1972 to 1978/II and the increase in the relative price of Japanese goods. At the same time one must recognize that these changes in competitiveness are both minor and, in some measure, transitory. The fact that they are minor is perhaps seen most strongly for the case of the U.S. and Germany. The fact that they are transitory is strongly evidenced by the case of the UK. In that country the substantial depreciation brought about a gain in competitiveness in 1974–1976. But that gain was soon eroded and is continuing to wither partly as a consequence of oil-related appreciation, partly under the pressure of increasing wage settlements.

On balance then international price linkages have to be looked at with considerable qualification. There is clearly a tendency for exchange rate adjusted prices "to stay in line." It is important, though, to recognize that the pressure in that direction varies substantially across countries as does the speed with which that process takes place.

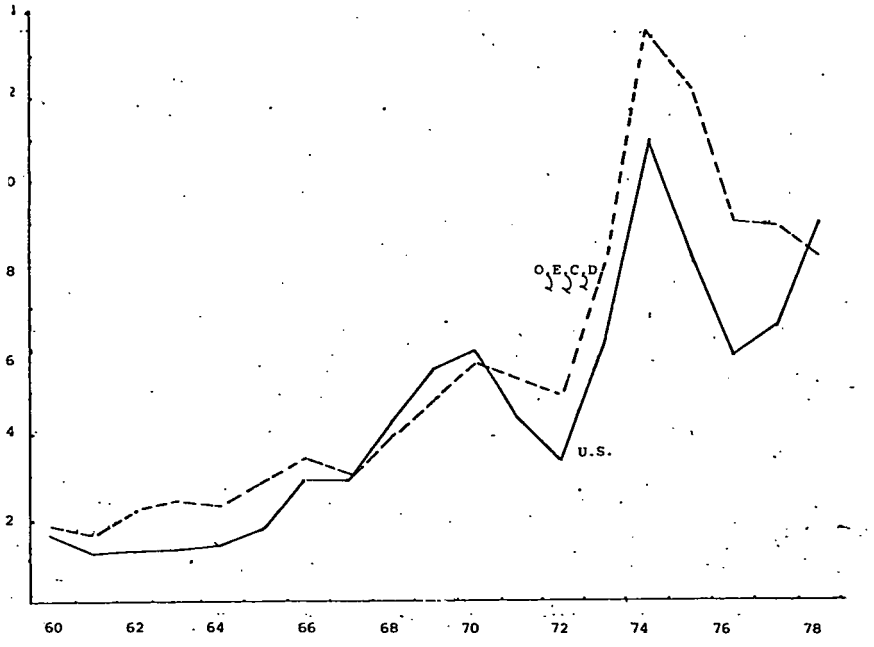


CHART 3.—Comparative inflation rates.

This chapter has reviewed a variety of channels through which the U.S. is linked to the world economy. All the evidence suggests that these links are effective, systematic and substantial. They are of sufficient importance to be an essential ingredient in macro-modeling of the U.S. economy. That lesson should be borne in mind when reviewing macroeconomics in the open economy. Such a review seeks to answer the question of how external disturbances or domestic policies work themselves out once the openness of the economy is an essential part of one's macroeconomic model.

III. STABILIZATION POLICY

In this part two related questions are discussed: How do external disturbances affect domestic income and employment, interest rates and prices? How can domestic monetary and fiscal instruments be used to offset domestic or foreign disturbances, recognizing the openness of the economy? Our discussion starts with a formal presentation of the open economy linkages. In the first section the linkages are studied in terms of national income accounting concepts. In the second section we extend the discussion to financial aspects by bringing in the linkages between the budget financing, domestic credit and the external balance. These preliminary considerations are followed by a study of "models" of the open economy in section 3. They consist mainly of key assumptions about the flexibility of prices, including the exchange rate, the integration of capital markets, and the extent of economic slack. Finally, this part extends the model to emphasize the supply side of the economy.

1. Saving, Investment, and Net Exports

This section introduces the open economy through the national income accounts. The point to be made is the following: In the open economy the trade deficit is *identically* equal to the budget deficit plus the excess of private investment over private saving. This key relationship thus establishes a link, though not causality, between a policy instrument—the budget—and the external balance. The following paragraphs proceed to develop that relation, noting that it is an identity which means that it is *not* a matter of opinion, theory or anything like that but rather a matter beyond discussion.

We start with the identity of the value of domestic output, Y, and total (actual) spending on domestic output:

$$Y \equiv C+I+G+X-M \tag{1}$$

where C,I,G,X,M have the conventional meaning of consumption, investment, government spending, export and imports. Since consumption investment and government spending refer to all spending by these sectors, whether it be on domestic or foreign goods, we have to make an adjustment to deduct total import spending (by these three sectors) and to add exports or foreign demand for our goods. The relation is an identity because, in accounting terms, investment includes involuntary inventory accumulation.[2] Subtracting net taxes (total tax payments less transfers), T, from both sides yields:

$$Y-T \equiv C+I+(G-T)+(X-M) \tag{2}$$

or, taking consumption to the left and noting that income less consumption is equal to saving, S, we have:

$$S-I \equiv (G-T)+(X-M) \tag{3}$$

The identity in (3) states that the excess of private sector saving over investment is equal to the budget deficit, $G-T$, plus the trade surplus, $X-M$. Table 8 shows the relevant figures for the U.S. economy for recent years.

The table shows the macro relationships of identity (3) with net foreign investment the equivalent of net exports and with the budget being the national income accounts budget of the government consolidated across Federal, State, and local levels. Private saving includes business saving as well as personal saving. Ignoring the substantial statistical discrepancy we can look to the table to find, in accounting terms, the counterpart of external imbalance. Thus in moving from 1974 to 1975 there is a vast increase in the budget deficit due to discretionary and automatic fiscal policy in the recession of 1975. The offsetting items are an increase in private saving, a decline in investment and an increase in net exports. Moving on to 1977, there is a decline in the budget deficit, but an increase in investment that exceeds the rise in saving. Accordingly, the external balance shows a deficit.

[2] For a more extensive discussion see an intermediate text such as Dornbusch and Fischer *Macroeconomics*, McGraw-Hill, 1978.

TABLE 8.—SAVING, INVESTMENT, AND THE BUDGET AND NET EXPORTS

[Dollars in billions]

	1974	1975	1976	1977
Budget surplus	−3.2	−64.4	−33.2	−18.6
Private savings	209.5	259.8	270.7	290.8
Private domestic investment	214.6	190.9	243.0	297.8
Net foreign investment	−4.5	11.9	−1.2	−20.9
Statistical discrepancy	5.8	7.4	4.2	8.6

Note.—Numbers may not add due to rounding.

Source: "Survey of Current Business," July 1978, p. 47.

The identity thus serves the useful purpose of linking key macroeconomic aggregates. It tells us that we cannot have an unchanged budget, a rise in investment, no change in saving and yet expect an external surplus. The identity implies that an improvement in the external balance comes either from a reduction in the deficit, $G-T$, or from a decline in investment relative to saving.

It is tempting to view external balance problems as merely a reflection of an imbalance in the public sector between income and spending. Such a view has been argued in the United Kingdom where it has been asserted that the private sector essentially spends at the rate of disposable income so that at the margin private saving equals private investment.[3] This would, of course, imply that the changes in the budget are *one-for-one* translated into changes in the trade balance. This is doubtful even for the UK; it certainly is not the case for the U.S. Table 9 amply shows this. For the United States we have to go further and ask how particular fiscal measures affect each of the components in identity (3). The net effect of a fiscal measure on the trade balance depends in part on the discrepancy between private saving and investment that it introduces. Such questions are addressed below in section 3.

2. Domestic Credit and the Balance of Payments

In the previous section we looked at the relation between national income accounting measures of spending and saving by sectors and their relation to the external balance. We now turn to the place of the financial system in relation to the external balance. The starting point is the balance sheet of the central bank.

TABLE 9.—*Central bank balance sheet*

Assets:	*Liabilities*
Net foreign assets (NFA).	
Domestic credit (DC)	Highpowered money (H).
Other net.	

The central bank balance sheet shows that changes in net foreign assets or reserves are equal to changes in high powered money less changes in domestic credit. The latter is made up of lending to the government—the central bank's holding of government debt—and lending to the banking system:[4]

[3] See M. J. Fetherstone and W. Godley, " 'New Cambridge' Macroeconomics and Global monetarism. Some Issues in the Conduct of UK Economic Policy." in K. Brunner and A. Meltzer (eds.) *Public Policies in Open Economies* Carnegie Rochester Conference Series, No. 9, 1978.

[4] We neglect here the term net other assets.

$$\Delta NFA \cong \Delta H - \Delta DC \qquad (4)$$

The accounting relation shows that domestic credit expansion leads, one for one, to a reserve loss unless there is an offsetting expansion in high-powered money. The accounting framework plays an important role in identifying balance of payments policies. It establishes that an improvement in the balance of payments—a reduction in the rate of decline of foreign assets—requires a lower rate of monetary expansion relative to the rate of domestic credit expansion.

The accounting framework serves as a simple policy framework once it is argued that high-powered money expansion is determined by income expansion thus setting a limit on the rate of domestic credit expansion compatible with balance of payments equilibrium. Fixing the rate of credit expansion by the central bank therefore is one way of exercising proximate control over the balance of payments. The framework immediately connects with the question of budgetary policy since domestic credit is mostly holdings of government debt. Changes in domestic credit mean open market operations or monetizing of government deficits. Control of domestic credit therefore implies that public sector deficits are financed outside the central bank.

The analysis can readily be extended to the consolidated banking system. In this perspective we substitute the consolidated monetary liabilities of the banking system (M_2) for high-powered money. The interpretation of the "policy equation" remains much the same: balance of payments improvement requires that domestic credit expension be kept low relative to the rate of monetary expansion. How to keep a check on domestic credit expansion? The two standard procedures are direct ceilings on bank lending combined with control of the public sector deficit.

3. Two More Linkages

We have already studied two linkages between the home economy and the rest of the world. One arises from the sectoral income spending balances and emphasizes the government budget deficit as one of the sources or counterparts of external imbalance. The other approach looks at the balance sheet of the consolidated banking system and focuses on domestic credit creation—and thus implicitly at least in part at financing of budget deficits—as a source of external asset decumulation. The remaining two relations emphasize price relationships. The following analysis looks first at the trade balance in relation to relative prices and then turns to capital flows and interest rates.

A. TRADE FLOWS AND COMPETITIVENESS

Among the popular explanations of external imbalance are excess spending or lack of competitiveness. The views are not necessarily incompatible. We concentrate here on competitiveness by noting that for given income and spending levels relative prices will determine the allocation of spending between goods. The lower are the prices of the goods produced in the U.S. compared to those produced abroad the larger the share of world spending that falls on our goods. Denoting the relative price of our goods Θ we can write the trade balance or net exports, NX, as:

$$NX \equiv X - M = NX(\Theta, Y_{,}) \qquad (5)$$

The lower Θ, the relative price of our goods, the larger net exports. Exports are larger and import spending is lower.[5]

The emphasis on competitiveness is adopted here because it introduces one of the important adjustment instruments. Noted below are changes in relative prices as one means by which the potentially divergent requirements of full employment and external balance can be reconciled. This point becomes apparent when we note that the trade balance depends, of course, not only on relative prices but also on aggregate income or spending. A higher level of spending implies higher import spending and therefore a smaller surplus or a larger deficit. To maintain or restore external balance, an offsetting change in relative prices would be required. An alternative, at least in the short run, is to finance the trade deficit through capital flows. This is the aspect we turn to next.

B. INTEREST RATES AND CAPITAL FLOWS

The second linkage to be considered here is that between capital markets. As a first approximation one can assume that financial capital or portfolio investment flows in the direction of the high interest rate country. A country with high interest rates will attract foreign capital as lenders seek to hold their securities while borrowers turn to the low interest countries as a source of funds.

We can formalize this idea by writing the net rate of capital flow, K, as a function of the international interest differential, λ. The higher is λ the higher is our interest rate compared to that abroad and accordingly the higher is the rate of capital inflow:

$$K=K(\lambda, \ldots)+\overline{K} \tag{6}$$

where the term $\overline{K}$ denotes "autonomous" capital flows, that is flows independent of the interest differential. Along these flows we note in particular long-term capital flows including direct investment.

This treatment of the capital account is to be viewed as a description strictly of the short-run possibility of attracting capital due to interest differentials. These flows cannot be sustained since they merely reflect a reallocation of portfolios internationally. Once the full adjustment has taken place interest differentials will at best affect the allocation of current saving between domestic and foreign securities. They therefore have a much less significant longrun impact on capital flows.

We can now combine the trade balance and capital account in discussing the overall balance of payments, B:

$$B=NX(\Theta, Y \ldots)+\overline{K}+K(\lambda, \ldots) \tag{7}$$

The overall balance of payments is simply the sum of net export receipts and net capital inflows. An increase in the relative price of

[5] This statement implicitly assumes that quantities are sufficiently price responsive so that when a decline in export prices reduces revenue there is a more than compensating increase in sales. See Caves, R. and Jones, C. "World Trade and Payments;" Little Brown, 1973.

our goods, because it makes us less competitive, will worsen the trade balance and balance of payments. To maintain overall payments equilibrium a less favorable competitive position would have to be offset by a more favorable interest differential that draws in capital flows on a level sufficient to "finance" the trade deficit.

This idea is expressed in figure 1 that shows the schedule B=0 as the balance of payments equilibrium schedule. An increase in our relative price, Θ, leads to a deficit unless it is offset by a higher interest differential, λ. Points to the right of the schedule, such as point A, correspond to a surplus—interest rates at home are too high, given our competitive position, so that capital flows more than cover the trade deficit. Points to the left such as point C correspond to a deficit.

The position of the balance of payments equilibrium schedule is determined by income and spending which affect the trade balance and by autonomous capital flows, $\overline{K}$. An increase in spending at home shifts the whole schedule down and to the right—to maintain balance of payments equilibrium at a higher level of overall spending the U.S. either has to be more competitive so that a smaller part of our higher spending falls on imports or interest rates have to be higher at home to draw in enough capital to cover our trade deficit. Similarly, a change in autonomous capital inflows will shift the schedule up and to the left. The capital flow by itself will give rise to a surplus. To maintain equilibrium we would either have to be less competitive (a higher θ) or have lower interest rates thus bringing about a reduced inflow of interest sensitive capital.

The external sector of the economy has now been tied in a number of ways to key variables that concern domestic policymakers. In particular, the models just discussed establish a link between the balance of payments and such variables as income and spending, competitiveness and interest rates.

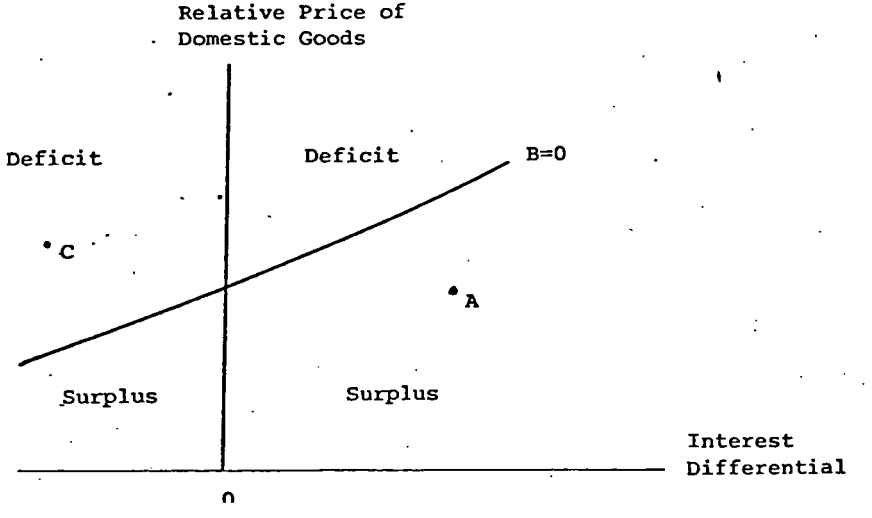


FIGURE 1

The next step in the analysis is to consider how policies affect simultaneously income, interest rates and the balance of payments and what implications different balance of payments adjustment processes have for the effectiveness of policies.

To motivate our analysis, consider a circumstance where the U.S. starts with a position of initial trade and balance of payments equilibrium. Suppose now there is a decline in world demand for our goods. At the initial interest rate differential and relative price we now have a deficit. Accordingly, either competitiveness has to be improved or interest rates at home have to rise relative to those abroad. From the external point of view we are indifferent about these policies. Of course on the domestic front we are not at all indifferent. The decline in foreign demand has already created an excess supply of domestic goods and thus an employment problem. Higher interest rates would only worsen the situation. From the domestic point of view, we would clearly look to improved competitiveness as an adjustment that reconciles at the same time the objectives of external and internal balance. An alternative, at least in the short run, is to use a combination of interest rate and fiscal policy. Such a policy mix would use fiscal expansion for domestic balance and higher interest rates for external balance. The following section contains a more detailed discussion of these ideas.

4. Stabilization Policy Under Fixed Real Rates

In this section we study stabilization policy for the case where output is demand determined and relative prices or real exchange rates are given. This is the standard Keynesian model and it remains an important conceptual framework for the understanding of stabilization policy.

Figure 2 shows $\bar{Y}$, the full employment level or output, and the balance of payments equilibrium schedule, B=O. The latter is positively sloped to reflect the fact that higher income levels lead to increased import spending and thereby to a trade and balance of payments deficit. To achieve overall balance of payments equilibrium higher income levels must therefore be accompanied by higher interest rates. The higher interest rates would attract capital flows and thus finance the trade deficit. Moving up and along the external balance schedule thus implies a growing trade deficit financed by a capital account surplus or borrowing abroad.

The schedule II shows equilibrium in the market for our goods. A lower interest rate implies higher levels of spending and thus increased demand for our output. To maintain equilibrium the supply of goods, Y, has to be larger. The schedule is drawn for a given relative price of our goods compared to those abroad and for a given stance of fiscal policy. Increased competitiveness, cuts in taxes or increased government spending all would raise demand at the going interest rate and thus bring about a higher level of equilibrium output. In terms of figure 2 this implies that these changes shift the II schedule to the right.

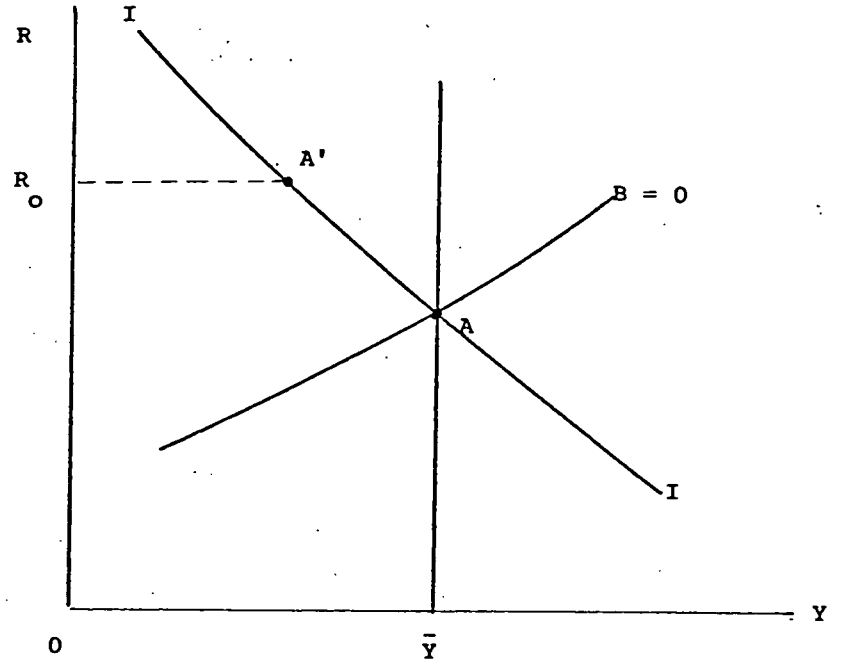


FIGURE 2

It is apparent from figure 2 that only at point A is there simultaneously internal balance and external balance combined with full employment. This means that for a given competitiveness and fiscal policy there is only one level of the interest rate that will secure full employment equilibrium. If the interest rate were higher, say R_o, investment spending and therefore equilibrium output would be lower. We would be at point A′ with unemployment and a balance of payments surplus. This leads to the discussion of adjustment processes since the question naturally arises whether the economy could stay at a point like A′ or whether it would automatically move to point A.

There is indeed an automatic adjustment process that operates to restore equilibrium at point A given an initial position of a balance of payments surplus and unemployment. The adjustment process in question relies on the effect of payments imbalance on the money stock and hence interest rates. As noted in section 2 above, there is a link between changes in the central bank's external assets and the money stock. Intervention in the foreign exchange market in support of a fixed exchange rate implies, in the case of a surplus, that the central bank buy foreign exchange or accumulate reserves. The counterpart in the central bank's balance sheet is an expansion in high-powered money. The normal adjustment process to a surplus is therefore a monetary expansion and falling interest rates. With a decline in interest rates, spending and hence income rise so that the domestic unemployment problem is alleviated. At the same time, the external balance is corrected since the income expansion raises imports thus reducing the surplus while the decline in interest rates directly reduces the rate of capital inflow.

The monetary adjustment process that links *automatically* changes in the money stock to external imbalance serves to correct simultaneously the internal and external balance problem. Two important reservations have to be introduced to qualify these results.

The first is *sterilization*. What happens if the central bank offsets the monetary expansion implied by a balance of payments surplus by a reduction in domestic credit. Technically this means that the foreign exchange desk buys foreign exchange creating high-powered money and the open market desk undoes the money creation by selling debt. The net effect is thus no change in high-powered money and only a change in the portfolio composition of the central bank. It is quite apparent that such a system will, at least in the short run, make it possible for disequilibrium in the external balance to be perpetuated. Of course there are limits here, too, since the country is piling up—or worse, running out of—reserves.

For the case of the United States a further qualification is important. Not only do we have more or less automatic sterilization but it is also true that foreign central banks hold their reserves not in US money but rather in Treasury bills. Therefore changes in foreign reserves would in the first place show their effects in bond markets.

A second important qualification concerns the equilibrium point A. It is not in general true that for a given (arbitrary) relative price internal balance at full employment and external balance can be achieved simultaneously. This point is readily appreciated from the following experiment. Suppose we start in figure 3 with full equilibrium at point A and now foreign interest rates increase so that at the initial equilibrium there is now an external imbalance. To attain the same rate of capital inflow interest rates would have to be higher, matching the higher level of foreign rates. Accordingly the B=O schedule shifts upward to B′=O. Three points can be considered. At A there is internal balance and full employment, but we have a balance of payments deficit since capital flows are no longer sufficient to finance the current account. At A″ we have full employment and external balance but interest rates are too high so that domestic demand falls short of full employment output. Finally at A′ there is internal and external balance as well as unemployment.

Where would the monetary adjustment process lead in this case? Starting from the initial equilibrium at point A, the impact of the foreign interest rate increase is a capital outflow and therefore a balance of payments deficit. The incipient depreciation of the exchange rate is prevented by the monetary authorities selling foreign exchange in return for domestic money. The domestic money stock thus is declining and interest rates are rising. With increasing interest rates, spending and income decline, a process that continues until the unemployment equilibrium at A′ is reached. Only at point A′ is the money stock, and hence interest rates, constant and demand equal to supply of domestic goods. There remains, of course, a longer term adjustment process that is induced by unemployment. Discussion of that longer term process will be in a later section.

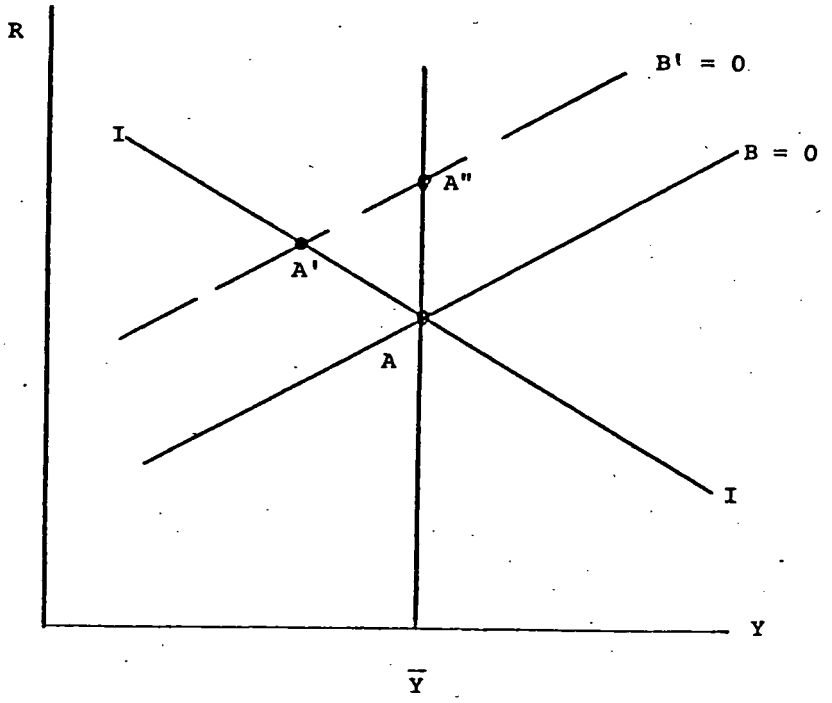


FIGURE 3

We have now reached the point where the fixed real rate system poses a policy problem: how to achieve simultaneously internal and external balance at full employment. One answer, just alluded to, is to wait for unemployment to affect wages and prices and thereby competitiveness. Changes in competitiveness would afford us with the needed instrument. Since that process is, however, slow and painful we consider here active policy interventions that can restore balance without the need for protracted unemployment.

Stabilization policy in the case where equilibrium would be achieved at a level other than full employment can be thought of in terms of table 10. Situations are classified in terms of the state of the balance of payment (surplus or deficit) and the level of employment or resource utilization (boom or slack):

TABLE 10

	Surplus	Deficit
Boom	R↓;F↑	R↑;F↑
Slack	R↓;F↓	R↑;F↓

The table suggests that in the case of a boom and a surplus, we should lower interest rates (R↓) and tighten fiscal policy (F↑). Conversely, when there is a deficit and economic slack we want to raise interest rates and ease fiscal policy. The policy mix allows us

to achieve simultaneously internal and external balance. (In figure 3 it amounts to using fiscal policy to shift the internal balance schedule to intersect the external balance schedule at full employment).

We can now return to our example of an increase in foreign interest rates that in the absence of fiscal policy leaves us with an unemployment equilibrium. It is clear that if the economy were to be at full employment, then interest rates would have to be sufficiently high to maintain external balance. With high interest rates, however, demand would be low and, indeed, fall short of full employment output. Accordingly we use a fiscal expansion to increase demand thus offsetting the depressing effect of high interest rates.

The idea of a monetary-fiscal policy mix is a powerful one in that it recognizes the variety of instruments and the possibility to use the capital account to finance the trade deficit. There are nevertheless sharp limitations to such a policy mix that must be brought out:

A first limitation concerns the composition of the balance of payments. In the use of the policy mix we use interest rate policy to induce capital flows to "finance" the trade imbalance. This immediately points to the short-term nature of the analysis since it is quite apparent that we cannot indefinitely finance a trade deficit by continued borrowing. The policy mix is thus at best a transitory intervention that is justified for a short-term, self-liquidating disturbance such as a foreign business cycle for example. It is not a long-term policy.

The latter point is reinforced by consideration of the domestic implications of our policy mix. To achieve full employment balance, policymakers use both interest rate and fiscal policy, which of necessity affect the composition of aggregate demand between investment and consumption and the balance of the economy between the private and public sector. It is important to recognize that it is only in the short term that monetary and fiscal policy should be used to stabilize demand at the full employment level subject to the external constraints. In the longer term, once again, we need to adjust to the external constraints, and that adjustment may or not involve a change in fiscal policy. More likely the longer term adjustment will require changes in competitiveness that should not be forestalled by an excessive reliance on fiscal policy.

The policy mix has so far been discussed only in terms of broad fiscal policy measures such as tightness or ease. Of course the many side constraints or objectives of policy can in some measure be satisfied by a more differentiated use of fiscal tools. Thus, for example, the effect of high interest rates on investment could be offset by investment tax credits or a reduction in corporate taxes. There is thus some scope to maintain neutrality although, of course, one doubts that there is sufficient flexibility in fiscal policy to accommodate the short-term needs of a policy mix.

The lack of flexibility in fiscal policy means in practice that only one-half the policy mix is implemented. The rule will be to use tight monetary policy for the balance of payments but there will be no offsetting fiscal expansion. The outcome in deficit countries is therefore likely to be a deflationary system where maintenance of the fixed rate implies protracted unemployment at an overvalued real exchange rate.

5. *Longer Term Adjustment*

In this section we turn away from the Keynesian model of stabilization policy to see what long-term adjustment would arise in an economy where interest rates and relative prices are determined by real factors. In such a model we look at the joint determination of relative prices and interest rates that will allow full employment output and equilibrium in the basic balance. We disregard short-term capital flows characteristic of an economy with active monetary management and emphasize instead the longer term real factors.

Figure 4 summarizes our equilibrium conditions with R now denoting the long-term real interest rate and Θ again the relative price of domestic goods. Along II we have internal balance in the sense that demand for domestic goods is equal to the full employment supply.[6] Because it reduces demand, a higher real interest rate requires an offsetting gain in competitiveness to sustain full employment. Along BB we have basic balance. Longer term capital flows induced by the real interest rate level—the nominal rate less anticipated depreciation—finance the trade imbalance. Thus with a higher interest rate we have a basic balance surplus and require an offsetting loss in competitiveness to maintain basic balance. Accordingly the basic balance schedule is positively sloped.

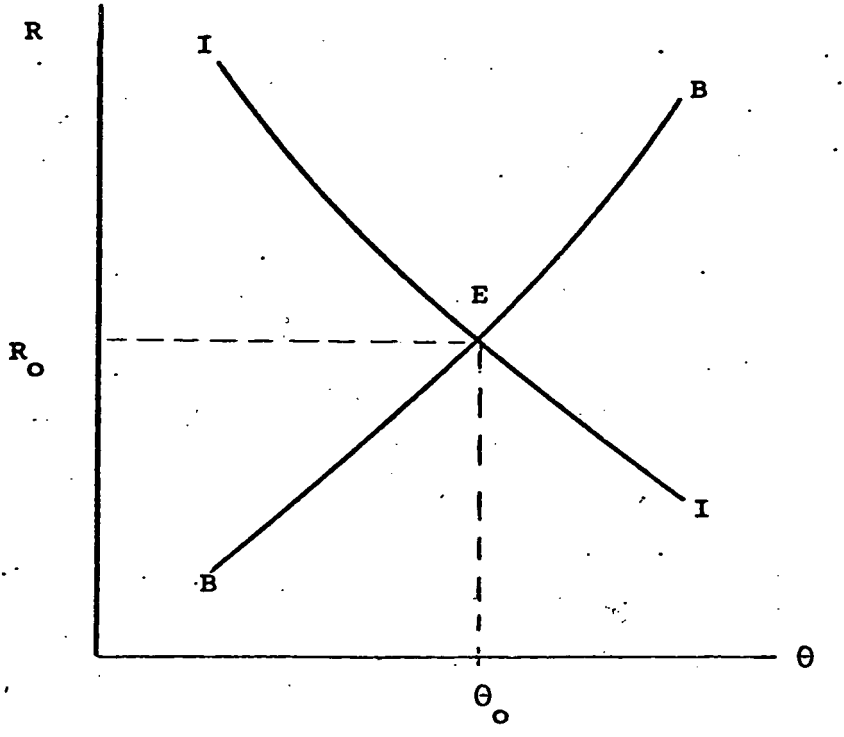


FIGURE 4

[6] The equations for the II and BB schedules are respectively: $\overline{Y}=A(\overline{Y}, R)+NX(\Theta, \overline{Y})$ and $B=0=NX(\Theta, \overline{Y})+\overline{K}(R)$, where $A(\ )$ denotes aggregate domestic spending.

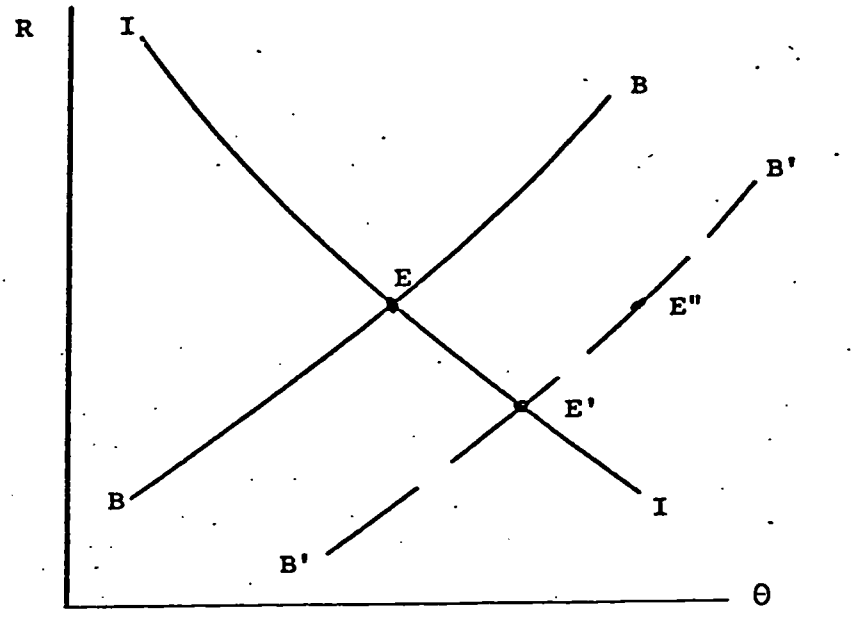


FIGURE 5

The long-term equilibrium of the system is at point E where we have full employment equilibrium in the domestic goods market and equilibrium in the basic balance. This is an equilibrium without "active" policy management although, of course, it is not independent of fiscal arrangements.

Now what is the adjustment process if this long-run equilibrium were disturbed? Suppose there is a shift in world capital flows and that at the prevailing real interest rate and relative prices there is now a net capital inflow and a basic balance surplus. The BB schedule shifts down and to the right and our new equilibrium is at point E' with a decline in interest rates and a deterioration in our competitive position.

The adjustment process can be described in the following terms: The initial shift in world lending (shown by the shift of the BB schedule) puts immediate balance of payments pressure on the exchange rate. The real exchange rate will appreciate to point E" in the first place but that leaves disequilibrium in the goods markets. Domestic wages and prices will start falling, as will the interest rate, until point E' is reached.

What is the lesson of this longer term adjustment process when it is set in contrast with the Keynesian model of stabilization policy? The main lesson is that long-term adjustment to changes in the basic balance requires changes in both real interest rates and competitiveness. If the disturbances are permanent, then using the policy mix pastes over the disequilibrium and is likely to delay adjustment. In the longer term, adjustment is inevitable and the policy mix should certainly recognize the direction in which competitiveness and real interest rates have to move.

6. Flexible Exchange Rates

This section introduces the discussion of flexible exchange rate regimes. We start off with a world where there is *no* capital mobility in response to interest differentials. In such a world we are concerned with internal balance—domestic output at the full employment level—and external balance. External balance here means that autonomous capital flows match the current account imbalance.

Assume for the present that interest rates are set by monetary policy and are exogenous; we also maintain that domestic and foreign prices are given. That latter assumption implies that changes in the exchange rate change, one for one, the relative price of domestic goods. To recognize this latter point we define domestic and foreign prices as P and P* respectively. The exchange rate is denoted by e, measured as units of domestic currency for unit of foreign currency. With these definitions the relative price of domestic goods is:

$$\Theta \geq P/eP^* \tag{8}$$

The relative price measure has the interpretation (or dimension) of units of foreign output per unit of domestic output. It thus tells how much our exports buy in terms of imports. Accordingly, the lower Θ the more adverse our terms of trade.

Now, how will an exchange rate change affect competitiveness or relative prices? An increase in the domestic currency price of foreign exchange or a rise in e will worsen the terms of trade or raise import prices (eP^*) relative to export prices (P). Our exports will buy fewer imports and our goods will become cheaper compared to foreign goods. Thus, as long as there is no offsetting movement in domestic or foreign prices, that is P or P^*, exchange rate movements change relative prices and thereby affect trade flows.

What is the impact of relative prices on trade flows? As before, we maintain that a decline in the relative price of our goods will raise net exports. Accordingly, a depreciation will raise demand for domestic goods and improve the current account. Assuming for the moment that output is entirely demand determined, then figure 6 shows how exchange rates, exogenous capital flows and fiscal policy interact in determining output.[7]

Figure 6 shows combinations of the exchange rate and domestic output that yield equilibrium in the market for domestic goods—the II schedule—and in the external balance—the B=O schedule. An exchange rate depreciation (a rise in e) makes us more competitive and thus shifts demand toward domestic goods creating an excess demand. To restore equilibrium, output must rise to meet the increased demand. Moving up along the schedule, the exchange depreciation improves the trade balance, raising net exports and thus creating increased demand for domestic output.

Along the B=O schedule there is external balance. The schedule is drawn for a given level of world income and given exogenous capital flows, $\overline{K}$. A depreciation, by raising net exports, improves our trade balance and thus gives rise to an overall surplus. To restore external balance, income and therefore imports must rise.[8]

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[7] The internal balance schedule is given by the equation: $Y=A(Y)+NX(e, Y)$ and the external balance schedule by $B=O=NX(e, Y)+\overline{K}$ where $\overline{K}$ denotes exogenous capital flows.

[8] The $B=O$ schedule is steeper than the II schedule as can be inferred from the equations in the preceding footnote.

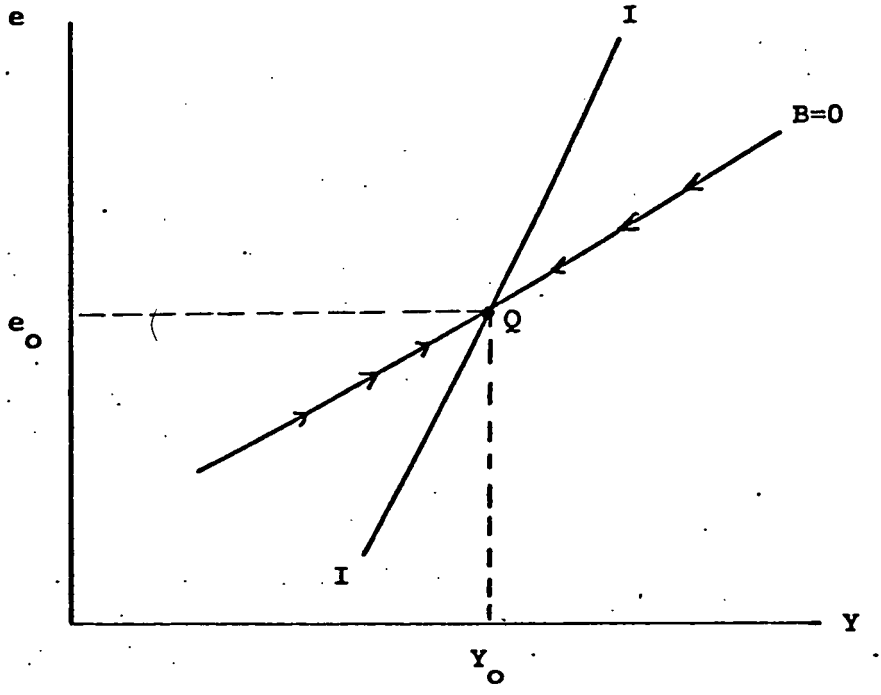

FIGURE 6

The equilibrium income level and exchange rate are jointly determined at point Q, where we have goods market equilibrium, though not necessarily full employment, and external balance. The adjustment process can be thought of in terms of output and exchange rate movements. Suppose the exchange rate adjusts rapidly, or indeed instantaneously thus maintaining external balance along the B=O schedule. But with points above and to the left of the II schedule corresponding to an excess demand for domestic output there is an output expansion. Points to the right imply an excess supply of goods and therefore a contraction. Thus the adjustment process leads us to point Q where the goods market and the external balance are jointly in equilibrium.

What does this model suggest about the impact and channels of fiscal policy? A fiscal expansion would imply an increase in aggregate demand at the initial exchange rate and income level. The II schedule shifts out and to the right. At the initial exchange rate, income would expand to point Q' in figure 7. At that point, however, the increased income has induced increased import spending and has thereby led to an external deficit. The deficit causes an exchange depreciation which now shifts demand toward domestic goods and further adds to the expansion.

The process continues until we reach point Q'' where external balance and goods market equilibrium are restored. What lesson can we draw from the analysis? The lesson is that under flexible exchange rates, and in the absence of capiral flows, fiscal policy will leave the trade balance unaffected, the incipient deficit due to the income expansion leads to an offsetting depreciation that restores external balance and amplifies the expansion.

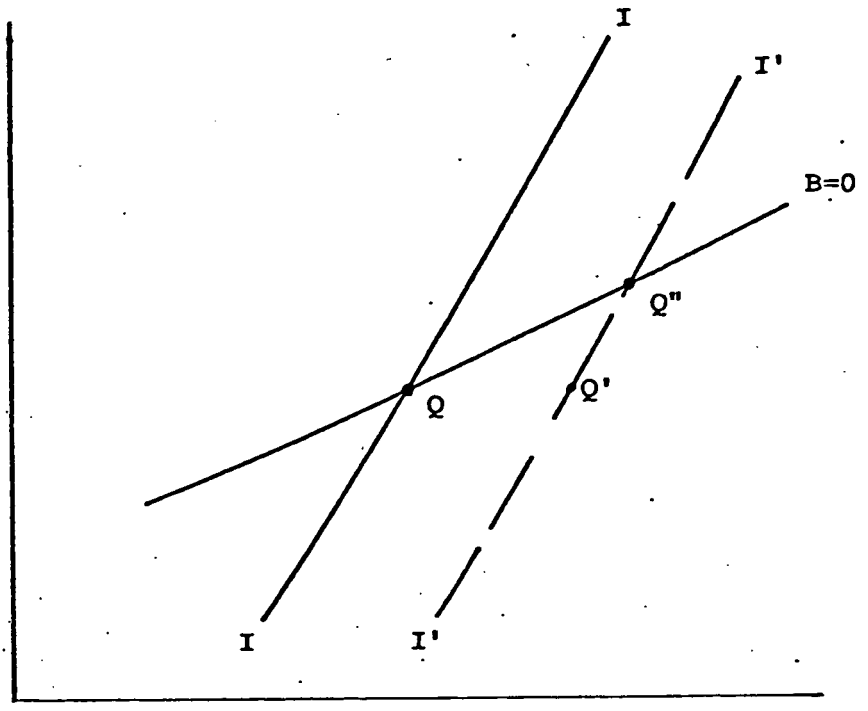

FIGURE 7

On the surface the model suggests that fiscal policy under flexible exchange rates is fully effective, leaving aside for the present the question of price adjustment or output adjustment. This result must be qualified, however, in an important manner by recognizing that the output adjustment is achieved at the expense of a worsening in the terms of trade. The exchange depreciation implies that the relative price of domestic goods declines or that it now takes more of our exports (and labor) to buy a given amount of imports. This must surely be thought of as a cost. It certainly is not appropriate to take the output expansion to be one for one an expansion in *real income*. The reason is simply that the purchasing power of our output in terms of imports declines. The output expansion, in a sense, comes with a loss in real income to those already employed. It is thus a policy that is potentially unfavorable. This is certainly the case if imports form an important part of the domestic expenditure pattern and if the depreciation is large, as it will be if the trade flows are not responsive. We draw attention to the role of the terms of trade in the trade balance adjustment process to dispel the idea that exchange rate adjustment can, in some miraculous way, give us external balance without tears. Trade balance adjustment must involve a cut in income at constant prices or a loss in the purchasing power of income through terms of trade adjustment. Flexible exchange rates will aid the adjustment if there is sufficient money illusion or if there are institutional arrangements that favor price adjustment through the exchange rate rather than through domestic wages and prices.

7. *Interest Rates and Capital Flows*

How would the preceding analysis change with interest responsive international capital flows? Suppose the money stock were fixed. The fiscal expansion would tend to raise interest rates since the income expansion increases money demand. The increase in interest rates in turn attracts capital flows and thus improves the external balance thereby offsetting, in part at least, the impact of expanded incomes on imports and the trade balance. Which effect will dominate? If capital mobility is high, then the chief impact is for higher interest rates to dominate the balance of payments. The improvement in the balance of payments causes the exchange rate to appreciate and thus to raise the relative price of domestic goods. With a loss of competitiveness there is a tendency for reduced net exports to offset the increased level of government spending. There is *crowding out* through the channel of higher interest rates on the exchange rate and therefore on net exports.

It is worth summarizing these results, because they are strikingly different from the fixed exchange rate case. Under flexible exchange rates, given the nominal money stock, fiscal expansion will tend to raise interest rates and thereby draw in net capital flows. The resultant surplus in the external balance causes an exchange appreciation and a reduction in net exports. The net effect of a fiscal expansion is thus dampened through two channels: The higher interest rates will reduce interest sensitive components of spending in a manner familiar from the closed economy. The additional effect derives from the interest responsiveness of international capital flows. The capital inflow will appreciate the exchange rate, cause a loss of competitiveness and therefore a loss in net exports. This channel thus acts as a further dampening affect of a further channel for "crowding out."

Will there be a net expansion at all? This will depend on the degree of capital mobility. The polar case is one where capital mobility is complete so that only at the world interest rate external balance can be achieved. With lower interest rates there are large persistent outflows, with higher rates large persistent inflows. In this case, as is readily recognized, our interest rate cannot diverge from the world level. This implies that the exchange rate will appreciate until net exports have declined by exactly the increase in government spending. The level of income is unchanged and the increased budget deficit matches the worsening in the current account. This extraordinary result is the conclusion reached by Robert Mundell. It highlights the essential role of capital mobility, but it highlights also, once again, the link between the budget and the external balance. In the open economy crowding out may be complete and increased government spending may be reflected in reduced net exports rather than a decline in domestic investment.

Even in the case where crowding out is not complete, we must recognize that the increased budget deficit leads to a worsening in the external balance. With higher interest rates there will be net capital inflows or external borrowing to finance the current account deficit. The budget deficit is thus partly financed externally. Debt is accumulated that will ultimately have to be repaid through net exports. Again there is a real cost to the economy (different from the costs of debt finance in the closed economy that one may simply want to think of as a transfer).

Holding constant the money stock in the face of a fiscal expansion thus ensures that the budget will at least in part be externally financed. There is accordingly an analogy with the fixed rate case, and the question must again be raised under what conditions fiscal policy financed by external borrowing is advisable?

Suppose we wish to maintain full employment in the face of a loss of exports. One choice is to use a fiscal expansion, combined with tight money to have external balance and full employment. The fiscal expansion makes up for the loss of exports and the higher interest rates attract the capital flows to finance the trade deficit. Alternatively we hold interest rates, and therefore capital flows, at their initial levels and allow the exchange rate to depreciate until we have restored net exports, and therefore the demand for domestic goods, to their initial level. The former policy implies financing the trade deficit, the latter implies adjustment. What should be the mix between these polar cases? There are two considerations. First whether the disturbance is transitory or permanent. Only transitory disturbances can be financed. A permanent worsening in the external balance requires adjustment or the country would soon face a loss of confidence and adverse capital flows. A second consideration in the mix involves, of course, domestic objectives concerning the monetary-fiscal policy mix and the medium term path that monetary and fiscal instruments should follow. There are also more refined instruments that came to attention during the 1974–75 recession. Then countries such as Sweden, faced with a decline in world demand for their export products, viewed that decline as transitory and with public support continued production for inventory, pending a recovery of world spending. Such a policy, where it is feasible, is of course preferred since it involves a minimum of disruption and waste in the allocation of resources. To an important extent one would expect the private sector to follow such smoothing policies by themselves, provided there is fiscal framework that does not penalize inventories and that there not be excessive uncertainty about the real exchange rate.

How realistic is the framework set out so far? There are two important, interrelated difficulties that have been avoided so far. One is the influence of price and exchange rate expectations on capital flows and exchange rate determination. The other complication concerns the determination of domestic prices and the role the exchange rate may play in that context.

8. Exchange Rate Expectations

Exchange rate expectations play an overridingly important role in the determination of exchange rates. Investors will consider the total return on alternative assets, interest plus gains or anticipated losses from changes in the exchange rate. With domestic and foreign assets close substitutes we can state as an equilibrium condition the equality of total return:

$$R = R^* + (\bar{e} - e)/e \tag{9}$$

where R^* is the foreign interest rate and $\bar{e}$ is the expected future exchange rate. The term $(\bar{e}-e)/e$ measures the anticipated percentage depreciation. The equilibrium condition in (9) thus implies that domestic interest rates can diverge from foreign rates to the extent that

there is an offsetting anticipation of depreciation or appreciation. We can futher use (9) to solve for the current equilibrium exchange rate:

$$e=\frac{\bar{e}}{1+(R-R^*)} \tag{9a}$$

In this form the current equilibrium exchange rate is determined by two factors. The first is the prevailing interest differential; the second is the anticipated future exchange rate. The higher our interest rates relative to those abroad, the lower the exchange rate relative to its future level—high interest rates compensate for the anticipation of depreciation. Interest rates thus are one of the determinants of the exchange rate and, through this channel, monetary and fiscal policy exert their effect on the exchange rate.

The other important determinant of today's exchange rate is the expected future rate. News relevant to tomorrow's exchange rate will be immediately translated into anticipated depreciation or appreciation and thereby immediately exert its effect on the spot exchange rate. This is a powerful channel since it implies, in effect, that news about events even quite far into the future will have effect on today's exchange rate.

The asset market view has emphasized exchange rate determination along the lines of (9a). The approach notes that exchange rates are determined along with interest rates and that, as (9a) shows, they share the volatility of short-term interest rates. Furthermore, like asset prices they discount new information.

How can we embody this expectational framework in our model of the macroeconomy? The procedure is to add an assumption about exchange rate expectations. Particularly assume that the exchange rate is expected to depreciate in proportion to its deviation from the long-run equilibrium exchange rate:

$$x=\lambda(\bar{e}-e) \tag{10}$$

where x denotes the expected rate of depreciation and $\bar{e}$ now is the long-run equilibrium exchange rate.

Figure 8 shows the equilibrium of our macromodel, including exchange rate expectations as part of asset market equilibrium. Along the schedule AA there is asset market equilibrium. The public holds the existing stock of money and asset yields are equalized internationally, taking into account expected exchange rate changes. An increase in income will raise money demand and require higher interest rates for monetary equilibrium. With higher interest rates there is an international yield differential unless the exchange rate depreciates sufficiently (relative to its long-run value) to generate the expectation of appreciation at a rate just sufficient to offset the higher interest rate. Thus the AA schedule is negatively sloped.

Along the YY schedule goods and money market are in equilibrium. Higher output creates an excess supply both because the propensity to spend on domestic goods is less than one and because higher income raises money demand and thereby interest rates so that spending is depressed relative to income. To restore goods market equilibrium at higher interest rates, the exchange rate must depreciate thereby raising net exports. Thus the YY schedule is positively sloped. Movements up along the YY schedule imply a growing trade surplus.

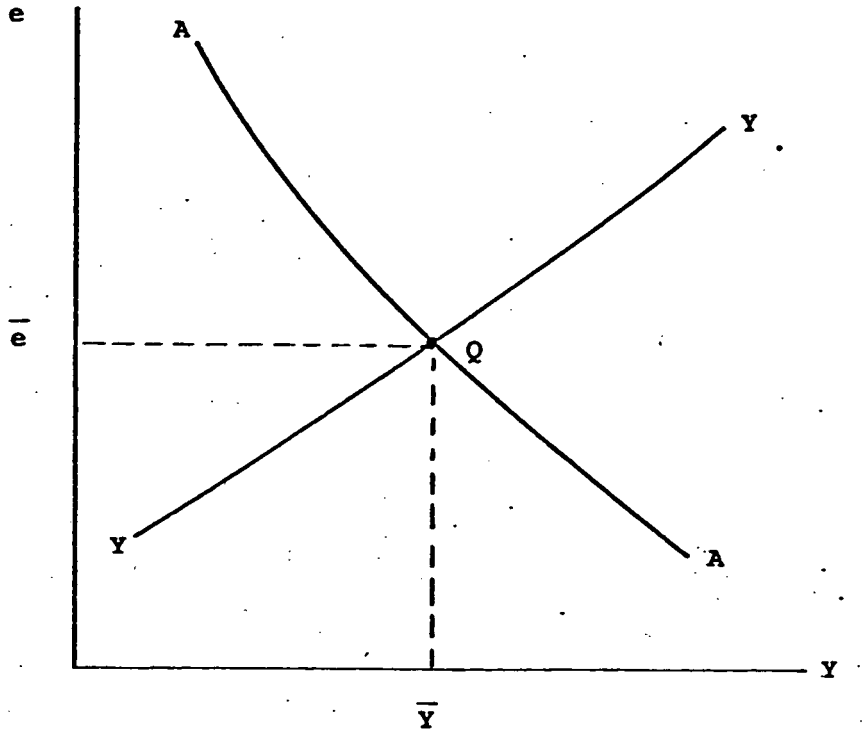

FIGURE 8

Now suppose that we start in full equilibrium at point Q and that there is a fiscal expansion that raises aggregate demand. We want to explore the implications of rapid versus slow exchange rate expectations formation to point to the pivotal role of these expectations in assessing the potency of stabilization policy. We start with the case of rational expectations which are formed in a manner that recognizes the new long-run equilibrium. The public recognizes that the increased spending will raise interest rates, and appreciate the exchange rate until the trade deficit offsets the increased spending so that interest rates and income are unchanged. The public thus anticipates a large depreciation and, of course, the spot rate will immediately depreciate and, without any output expansion taking place, will assume its new long-run level. Fiscal policy is entirely offset by the rapid formation of exchange rate expectations.

Consider next the alternative where exchange rate expectations are formed adaptively. Say the public revises its expectation of the long-run equilibrium exchange rate in the light of developments in the actual rate. When the actual rate depreciates, the long-run rate is revised upward. With this assumption there emerges scope for transitory effects of fiscal policy. In the first instance as government spending takes place and, because exchange rate expectations have not yet been revised, there is an expansion in aggregate demand and accordingly output will start expanding.

But along with rising interest rates and an appreciating exchange rate there will be revisions of exchange rate expectations. The exchange rate will appreciate more rapidly, the trade deficit will increase and it will increasingly come to offset the higher level of government spending. With declining demand because of a growing deficit, the output expansion will soon turn around. Output will start declining until the initial level is reattained. There will be complete crowding out, as was already noted above. The only difference now is that exchange rate expectations will determine how rapidly the expansion will come to an end. The more completely informed the public is the less expansionary fiscal policy will prove to be. Even with adaptive expectations there is only transitory scope for expansion.[9]

9. Output Supply and Price Adjustment

Throughout the analysis, we assumed that supply of output is perfectly responsive to demand at prevailing prices. We also assumed that an exchange depreciation will raise net exports, reducing imports and shifting demand toward domestic goods without such a demand shift, or for that matter the exchange depreciation itself, affecting domestic prices. In such a setting, depreciation is, indeed, an effective device for controlling the composition of aggregate spending and it is, therefore, an effective instrument in the adjustment of external balance.

In this section we have to question these assumptions and that purpose is best achieved by the polar case of real wage rigidity. We will build up a simple model of labor supply and pricing that, quite realistically, will show a response of domestic prices to a depreciation. In the limit the terms of trade are frozen by real wage demands and policy must turn toward more structural considerations.

We abstract for the present from issues of capital mobility and focus on the adjustment process of relative prices, θ. Figure 9 shows domestic full employment output at $\bar{Y}$. The (real) interest rate is given. Along YY goods market are in equilibrium. A decline in the relative price of our goods, θ, requires higher output for goods market balance since it stimulates demand through increased net exports. Along BB there is external balance. Higher relative prices of our goods shift demand toward net imports, creating a deficit so that external balance requires a cut in income and therefore import spending. The schedule is drawn for given autonomous capital flows or lending $\bar{K}$.

Now suppose that, starting from point Q, there is an increase in domestic spending on domestic goods. The YY schedule shifts up and to the right and our equilibrium is disturbed. At point Q′ internal and external balance obtain but there is overemployment. Such a point would cause us to lose competitiveness and is thus unsustainable. At point Q″ we have internal balance and full employment but also an external deficit because at the full-employment level of spending our prices are too high so that net exports are in deficit. A point like Q″ can be transitorily sustained, but only through net borrowing abroad. Over time there will be an adjustment because the growing indebted-

[9] For a more detailed analysis see R. Dornbusch "Expectations and Exchange Rate Dynamics." Journal of Political Economy, December 1976 and "The Theory of Flexible Exchange Rate Regimes and Macroeconomic Policy." Scandinavian Journal of Economics, 2, 1976.

ness lowers income at each level of output, thus causing spending to decline until it falls in line with income. There are thus two adjustment processes taking place over the medium to long term that are neglected by the traditional short-run macroeconomic model. These adjustment processes are essential because, for anything but a transitory disturbance, they describe the course the economy must take if it is to return to equilibrium. Fiscal policy should not attempt to frustrate that adjustment. We turn now in more detail to these adjustment processes, starting with the case of price adjustment.

A simple and quite realistic way to describe the pricing process is in terms of markup pricing by firms. Firms set prices as a markup over labor cost.[10]

$$P = (1+m)\, aW \tag{11}$$

where m is the percentage markup, W is the money wage rate and a is the amount of labor it takes to produce a unit of output or the reciprocal of the level of productivity. Prices are thus determined by the level of wages, by markup and by productivity. Wage increases are fully passed through, as are productivity gains. Next, assume that the markup moves cyclically. When output rises relative to normal, the markup increases as firms seize the opportunity to raise profit margins. The converse occurs during a recession. Thus the markup is a function of output relative to normal;

$$m = m(Y/\bar{Y}) \tag{12}$$

Labor, in setting money wages, seeks to achieve a given real wage, w:

$$W = w\bar{P} \tag{13}$$

Changes in the price level, $\bar{P}$ (as opposed to the price of our output P) are matched one for one by changes in money wages. The price level that labor looks at is made up of domestic prices and import prices:

$$\bar{P} = \bar{P}(P, eP^*) \tag{14}$$

and increases with either of these prices. In particular an increase, in the same proportion of import prices and domestic prices will raise the price level in the same proportion and therefore, by (13) will increase wage demands in that proportion. There is no money illusion.

Putting together now the behavior of firms and labor as described in equations (11) to (14) gives us an equation for the terms of trade as a function of output, productivity and the real wage demands:

$$\theta = \theta(w, a, Y/\bar{Y}) \tag{15}$$

An increase in real wage demands will cause an improvement in the terms of trade: at going import prices labor raises wages and firms pass on the wage increase into higher prices and thus generate improved

[10] This section draws on Modigliani, F., and Padoa-Schioppa, "100% Wage Indexation and More" Unpublished Manuscript, M.I.T., 1977.

terms of trade and a loss in competitiveness. A gain in productivity, by contrast, lowers unit labor costs and thus allows firms to charge lower prices. The terms of trade worsen and competitiveness is gained. Finally an increase in output, by raising desired profit margins, raises prices relative to wages. The terms of trade improve with real wages unchanged. Real wages fall in domestic goods but they rise in imports.

A final ingredient concerns the behavior of real wages, w. One assumption is that they are entirely exogenous. They are, as it were, controlled by unions that are impervious to unemployment. An alternative and more realistic scenario is one where real wages move slowly in response to unemployment or deviations of output from normal. Specifically we might postulate an adjustment process whereby real wages rise whenever output exceeds normal and fall whenever output is below normal;

$$\dot{w}=h(Y/\bar{Y}) \tag{16}$$

where $\dot{w}$ denotes the rate of increase in real wage demands.

For a given real wage, w_0, we show in figure 9 the terms of trade as determined by the interaction of firms and labor. The schedule is drawn for a given real wage and productivity level. We also show the goods and market external balance schedules discussed earlier. The economy starts in full equilibrium at point Q.

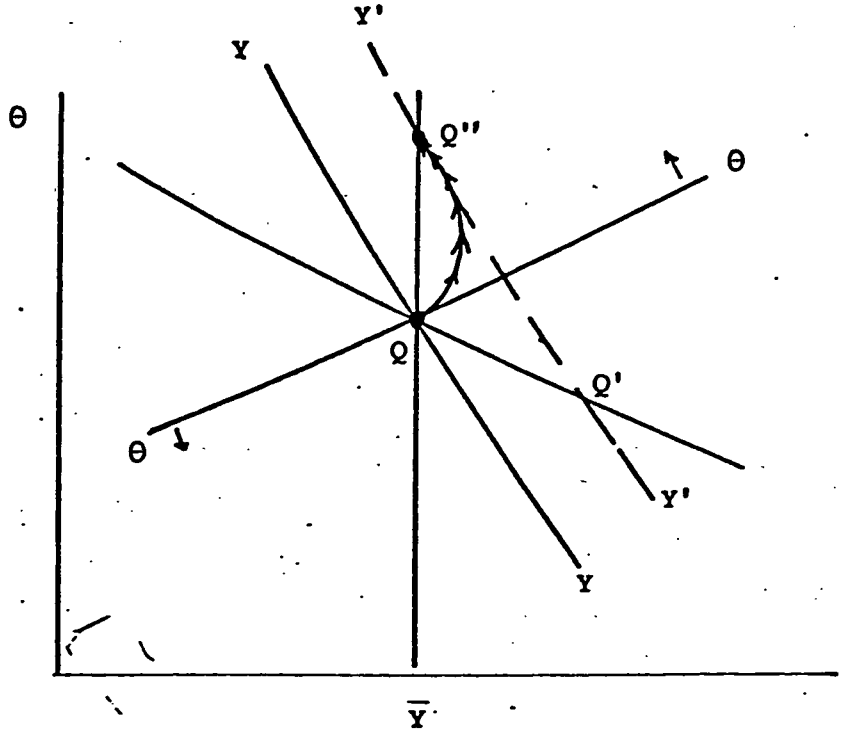

FIGURE 9

Suppose again there is a domestic demand disturbance so that spending on our goods increases at the initial level of income and prices. The YY schedule shifts to the right, as noted earlier. The demand expansion would, of course, in the first place cause an expansion of output. But as output rises above normal, firms will seek higher profit margins and thus the relative price of our goods rises. Some of the increased spending thus spills over into imports and the pressure of demand lessens. Output, however, is still above normal and accordingly unemployment is below normal. Accordingly *real* wage demands rise and the increase in wages is passed on by firms into higher product prices.[11] This serves to further divert demand toward imports, a process that continues until point Q'' is reached where output is back to normal but where the trade deficit equals the reduction in saving. Our terms of trade have improved sufficiently to divert demand toward imports to restore balance in the home market. Real wages have remained constant, having fallen in domestic goods but having risen in imports. Of course the economy cannot remain indefinitely at point Q'' because of the trade deficit. There will be a further adjustment process, involving the adjustment to external borrowing or lending, that will reduce spending to the level of income.

The analysis can be directly applied to the discussion of fiscal policy. What we just found out is that a fiscal expansion, at full employment, will cause a transitory expansion in output. In the long run, though, the demand expansion persists but it is no longer met by higher output but rather spills over fully into an increased deficit in the external deficit. A fiscal expansion in the long run improves the terms of trade but leads to a trade deficit equal to the change in the budget deficit. In the long run, fiscal deficits are externally financed through trade deficits. The adjustment process that brings about this crowding out is the response of profit margins and real wages to overemployment. With rising real wage demands and profit margins domestic prices rise relative to import process. Domestic industries lose competitiveness and demand shifts toward imports until the full expansionary effect of the budget deficit is offset by the loss in competitiveness.

The framework of analysis can also be used to show the role of fiscal interventions on the supply side of the economy. Supposedly, starting with full employment, a payroll tax is imposed but the proceeds are rebated through a lump sum income tax reduction so as not to confound the supply effect with the impact of the fiscal policy, through the budget surplus from tax collection, on aggregate spending. If real wage demands are unaffected by the income tax cut, then labor costs to firms rise and this increase is passed on as higher prices. The terms of trade improve together with a decline in demand for domestic goods. The payroll tax exerts a deflationary effect on the domestic economy because it has an adverse effect on competitiveness. Once output declines there will be downward pressure on real wages, a process that continues until money wages received by labor have declined enough to restore the initial level of prices and competitiveness. At that point, after-tax real wages are back to normal,

[11] In figure 9 this implies that the price schedule $\in\in$ shifts upward.

having been higher in the transition, and unemployment is back to normal as is the external balance. Payroll taxes thus exert a transitory deflationary effect on the economy.

Consider next the case of a gain in productivity and accordingly a rise in potential output, Y. In the short run output expands as real wages have not yet adjusted but unit labor costs have declined. The gain in competitiveness creates demand for domestic goods and thus leads to an output expansion. Figure 10 shows that the new long-run equilibrium will be at point Q' with higher output and a worsening in trade just sufficient to raise world demand for domestic goods to the higher level of the new full-employment output. How will that output be reached? In the transition process, prices will fall reflecting the gain in productivity. Wages will fall less than prices, reflecting the gain in real wages. Of course the new equilibrium at point Q' cannot be permanent. Again the trade imbalance, in this case a surplus, gives rise to further adjustments through asset accumulation implied by the external surplus. We turn to these considerations in the next section.

What bearing does this analysis have on flexible exchange rates as an adjustment process? The analysis shows that in the long run, the *real* exchange rate, Θ, is determined by the requirement of goods market equilibrium at the level of full employment. The real exchange rate does *not* ensure long-run external balance. The external balance is determined by income and spending and we have to appeal to a further adjustment process, involving asset accumulation and the resulting adjustment of income and spending, to achieve external balance. Viewed in this perspective, exchange depreciation is a means to move the real exchange rate from a disequilibrium position and to bypass the need for a protracted recession. Such a shortcut if possible if there is *no* real wage resistance. It is an empirical question, however, whether depreciation can bypass protracted unemployment—that is, whether there is enough rationality to recognize the requirement of a cut in real wages—or whether it is only in the face of unemployment that real wages are allowed to fall. In the latter case we would expect inflationary pressure as the depreciation-induced increase in import prices leads to wage and domestic cost increases that are passed on into higher prices without bringing about much of a real exchange rate adjustment.

10. Asset Adjustment and Long-Term External Balance

This section concludes the review of formal models in drawing attention to the long-term adjustment of income and spending. This process is the one most remote in time, but of course it is a process no less important than the short-run adjustment in output or the medium term adjustment in relative prices.[12]

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[12] For a more extensive analysis see R. Dornbusch and S. Fischer, "Exchange Rates and the Current Account." Unpublished Manuscript, M.I.T., 1977.

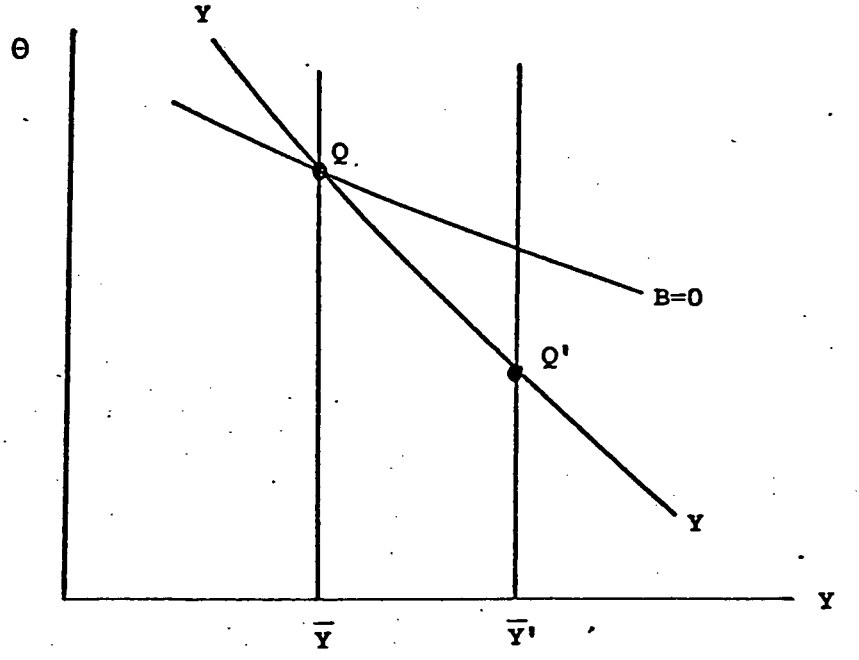


FIGURE 1

To formulate our analysis we introduce explicitly (external) assets, their influence on spending decisions and the relation between external imbalance or borrowing and lending and the accumulation of assets. Assume that saving and spending depend on wealth. Let the letter a denote the capital value of *net* external assets, measured in terms of foreign goods, and a/θ their value in terms of domestic output. Saving depends on wealth; it declines as wealth increases. It can readily be shown that when the goods market clears, saving is equal to the current account surplus. The surplus in turn measures the rate at which we are acquiring claims on the rest of the world. Accordingly, the rate of increase in external assets, $\dot{a}$, as determined by net domestic saving, is:

$$\dot{a}=\theta s(a/\theta) \tag{17}$$

In the market for domestic output, equilibrium requires that domestic demand plus exports equal the full employment supply, $\bar{Y}$:

$$\bar{Y}=D(\theta, a/\theta)+X^*(\theta) \tag{18}$$

where D and X^* denote domestic and foreign demand for our goods. An increase in the relative price of our goods—a rise in θ—creates an excess supply because it lowers the real value of assets thus lowering spending and raising saving and because it shifts demand away from domestic goods toward imports.

Figure 11 shows the equilibrium in the goods market as the schedule II. Higher relative prices of domestic goods create an excess of domestic output and thus require an increase in external assets to raise wealth and spending to restore internal balance. Along a=0 the current account is in balance. Higher external assets reduce saving and lead to decumulation thus requiring an increase in the relative price of domestic goods that reduces the real value of assets and thus restores the balance between income and spending. The arrows indicate that the economy will converge with external balance to a long-run equilibrium. In the long run, the current account achieves balance so that the trade deficit is matched by income from external assets. In the move toward external balance both assets and competitiveness adjust. Thus the model complements our earlier analysis by ensuring not only internal balance at the full employment level but also an asset adjustment process leading to current account equilibrium or equilibrium between income and spending.[13]

What does this extended model suggest are the effects of disturbances such as a loss of exports? A loss of exports would imply a reduction in demand for domestic goods. The impact effect would be a decline in their relative price so as to maintain full employment. But with a decline in the relative price, the real value of wealth rises and saving declines. Assets are thus run down, income and spending fall until we reach a new equilibrium with worsened terms of trade and a reduction in external assets. The trade balance improvement arises through the reduction in spending induced by lower assets and by the adjustment of world demand to a reduced relative price of domestic goods.

IV. A Perspective

We have now reviewed the theoretical models of the open economy showing how external disturbances or domestic policies exert their effects. Among the channels that received particular attention were the interdependence of aggregate demand through the trade balance, the interdependence of income and spending decisions as they are affected by accumulation or the running down of external assets, the international price linkage and the international integration of capital markets. Of course it must be recognized at this point that "models" of the economy are merely abstractions that center on an essential aspect of the economy, say a transmission channel, a price effect or the like. They do not, by themselves, allow a conclusion or a grand finale.

Rather than attempting a set of conclusions, we look here at some issues on U.S. policymaking that the previous analysis casts some light on. The first point to be made here concerns the operation of stabilization policy under flexible exchange rates and significant capital mobility. The closed economy view of stabilization policy would argue that unemployment can be reduced through increased aggregate demand and that a fairly flat Phillips curve provides the shortrun trade-off. Over time the Phillips curve will shift in response to inflationary expectations, but that adjustment will gain momentum only in response to a sustained expansion of demand.

[13] We are not considering here adjustment of the capital stock and hence of potential output. Such analysis is feasible but involves a considerable level of complexity.

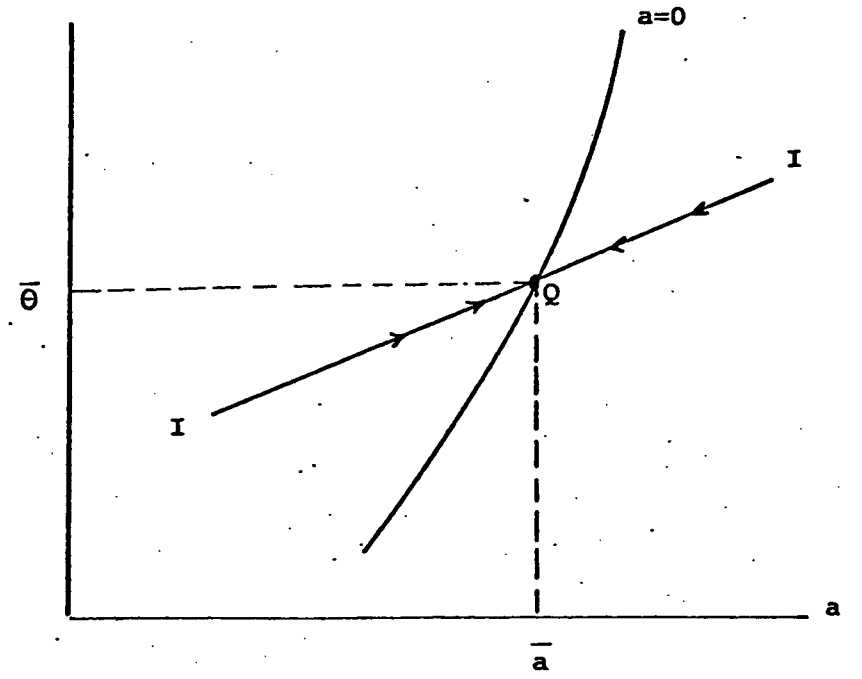


FIGURE 11

Under flexible rates the mechanism becomes dramatically different. Here an expansion, because it directly affects exchange rate expectations and because of the actual and anticipated current account deterioration, will lead to a depreciation in the exchange rate. The depreciation arises fast, before the policy has even had a substantial effect on aggregate demand. But with an exchange depreciation, there is an immediate impact on domestic import prices and on the general level of prices. It is in this sense that the Phillips curve becomes steeper under flexible rates.[14]

The extent to which the exchange depreciation raises import prices and affects domestic inflation varies substantially across countries. For the United States it is sensible to assume that a 10 percent depreciation will raise import prices by about 5 percent. This dampening reflects the fact that foreign prices will in part decline to absorb the exchange rate movement. In part the dampening reflects a shrinking of profit margins. Now given the increase in domestic import prices, what is their impact on inflation? A first approximation of the effect of import prices on domestic inflation is given in table 11 below:

TABLE 11.—PRICE EQUATIONS

Price index	Const	$\dot{P}_{-1}$	1/u	$\dot{P}_m$	R^2	DW
$\dot{P}_{CPI}$	0.002	0.43	0.007	0.15	0.64	1.92
	(.003)	(.14)	(.005)	(.03)		
$\dot{P}_{DEF}$	.004	.40	.004	.15	.78	1.96
	(.002)	(.10)	(.003)	(.02)		

[14] Dornbusch, R., and Krugman, P., developed this argument in "Flexible Exchange Rates in the Short-Run." Brookings Papers on Economic Activity, March 1976.

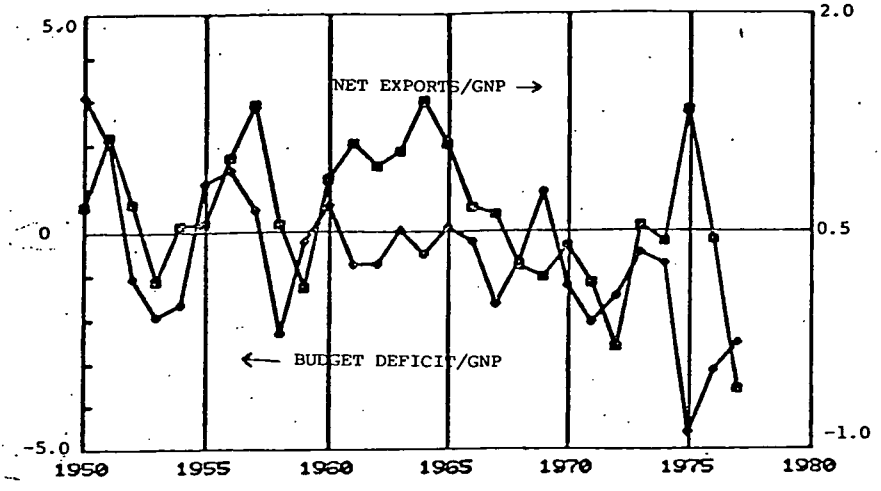
The equations (estimated on quarterly data for 1965–77) suggest that for a given unemployment rate, here denoted by u and measured by the prime male rate, a 10-percent increase in import price inflation will raise domestic CPI inflation by 1.5 percent in the same quarter and by 2.6 percent in the long run. Similar results obtain for the GNP deflator. The equations thus suggest that a 10-percent exchange depreciation, given the 0.5 passthrough into import prices, will raise the CPI by about 1.3 percent when all adjustments have taken place.

This effect is clearly of quite sizable magnitude. It is essential that it should be recognized and it is an important part of the explanation for the recent acceleration in inflation. This steepening of the Phillips cruve implies that stabilization policy in isolation becomes significantly more difficult unless it is accompanied by policies designed to stabilize exchange rate expectations.

The second issue to be discussed is the extent to which changes in the government budget exert offsetting changes in the current account. We have argued that to the extent that fiscal expansion raises (real) interest rates and leads to an appreciation this would worsen the current account and thus provide an offset or a crowding out. Chart 4 plots the government budget and the current account, both as a fraction of GNP. The chart reveals some tendency for the budget and the net exports to move in the same direction, perhaps most clearly in the 1950–55 period. It is certainly not correct, however, to argue that there is anything in the nature of systematic, full crowding out. Episodes such as 1975 where the budget was in a historically large deficit and net exports were historically high provide striking evidence to the contrary. What this suggests is that exchange rate expectations and monetary policy exert an important and sometimes overriding side effect in the effectiveness of fiscal policy.

A third and final issue to be discussed concerns the long-run real exchange rate of the dollar. This issue is important because there is a tendency to underestimate the need for real exchange rate changes as

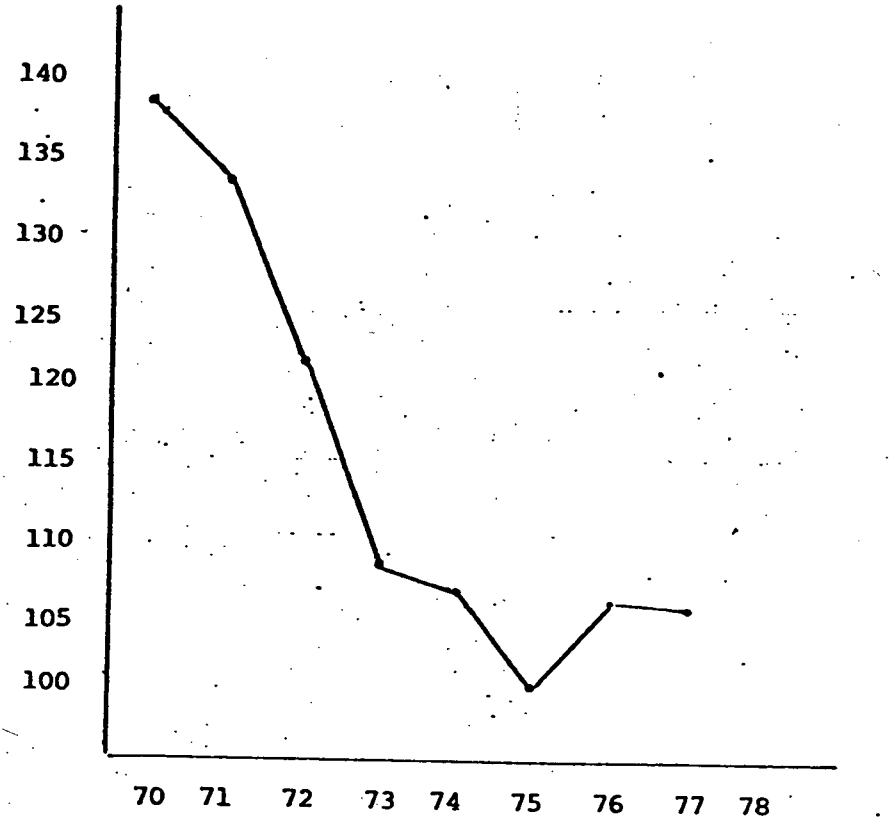
CHART 4.—The budget and net exports as a percent of GNP.



part of the evolution of the world economy. Exchange rate movements are primarily seen from a perspective of financial markets. Their use-

fulness is questioned because of their inflationary impact. The appropriate extent of exchange rate movements is frequently assessed by reference to purchasing power parity comparisons. An alternative view is that the United States has been developing a structural trade deficit. At full employment, the United States is losing competitiveness. Foreign countries are imitating U.S. technology and products and are moving beyond. As a consequence, the United States is losing in exports, and is starting to import manufactures on an increasing scale. This loss of competitive advantage occurred with Japan and Europe throughout the late 1950's and 1960's. It certainly was aided

CHART 5.—The U.S. real exchange rate.



Note.—Exchange rate adjusted relative value added deflators.
Source: IMF International Financial Statistics, November and December 1978.

in Europe by the EFTA and EEC arrangements. At present that trend is continuing in the LDCs that are rapidly emerging as major competitors in engineering products. In the 1960's attachment to fixed exchange rates led to a major overvaluation of the dollar, reflected in a growing full employment trade deficit.

The real exchange rate adjustment of the early 1970's has gone far in remedying the loss of competitiveness. What has to be recognized now is that the loss in competitiveness is continuing and that, unless the U.S. develops new products and techniques that are competitive in world trade at the going real exchange rate, a continuing real depreciation is required to maintain both full employment and external balance. What is the relevance of these considerations for domestic stabilization policy? The relevance is that there are alternatives to monetary and fiscal policy in maintaining full employment output. The alternative to expansionary fiscal policies is real exchange rate depreciation. In the short run, real depreciation may be inflationary but in the medium term it is the only sensible policy when one asks how to use resources effectively, how to maximize real income and how to run an economy without facing a growing role of fiscal policy because of an increasing aggregate demand problem.

INCOME TRANSFER PROGRAMS IN THE UNITED STATES: AN ANALYSIS OF THEIR STRUCTURE AND IMPACTS

By Sheldon Danziger, Robert Haveman, and Robert Plotnick*

CONTENTS

I. Introduction and Summary

This paper analyzes the Nation's most important income transfer programs—an interrelated but not integrated set of programs which provide cash or in-kind support to persons and their families. Public expenditures on these programs totaled nearly $200 billion in 1978. The objective is to describe these programs and to analyze their effects on the economy. Section I is a survey of the transfer programs and their objectives. Sections II and III describe the evolution of income transfer programs since the 1930's and analyze their impacts on poverty, income inequality, and regional income differentials.

In recent years, government income transer payments have increased more rapidly than other sources of personal income. New programs have been introduced (e.g., Medicare, Medicaid, and Food Stamps), benefit levels in existing programs have been increased (e.g., Social

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Security), and eligibility requirements and program rules have been liberalized (e.g., Aid to Families with Dependent Children—AFDC). Currently about 45 percent of all households (80 percent of all poor households) receive cash or in-kind support. Much of the increase in income support payments has benefited persons over 65. The aged head about 20 percent of all households, but receive about 50 percent of all transfers.

The incidence of poverty among persons, as officially measured, has declined from about 22 percent in 1959 to less than 12 percent today. If the value of in-kind transfers—now about $50 billion annually—is added to the cash incomes used officially to measure poverty, the incidence has fallen further, to about 7 percent now. Because a disproportionate share of the increased transfers has gone to the aged, poverty for them has fallen from 35 to 5 percent over the same period. The official poverty lines are adjusted only for price increases, and not for increases in real incomes; thus, the poverty line for a family of four has declined from 46 to 39 percent of median family income between 1965 and the present. If a relative poverty line (defined as a constant fraction of median family income) is used, poverty has not declined at all since 1965. Moreover, even if one accepts the low aggregate incidence of 7 percent, a serious poverty problem remains, particularly for women heading families and racial minorities. About one-third of all persons living with black female heads of households, one-seventh of all persons living with white female heads, and one-tenth living with black male heads remain poor.

This reduction in measured income poverty did not occur because economic growth or the programs of the War on Poverty provided a "hand up" for the poor to earn their way out of poverty. Increases in cash and in-kind transfers account for most of the progress against poverty. Indeed, if only earned income is considered, the aggregate incidence of poverty has remained unchanged at about 21 percent. Economic growth and expanded employment opportunities, however, did lead to increased earnings and reduced pretransfer poverty for some groups, most notably married black men.

These patterns in relative and absolute poverty are reflected in patterns of income inequality. As conventionally measured, income inequality has remained stable over the past 30 years, despite the massive increase in government transfer payments. If official measures are altered to account for both demographic changes and in-kind transfers, only a slight downward trend in inequality appears. While the growth of transfers has significantly reduced inequality by raising the incomes of the poor—about 40 percent of all transfers go to the poorest 20 percent of all households—this equalizing effect has only offset an increase in the inequality of earned incomes. While the growth in income support transfers may have contributed to the increase in earned income inequality the effect is small. In any case, if transfer payments were to be reduced, measured poverty and income inequality would rise substantially.

While these effects on poverty and income inequality are the intended and most visible impacts of transfer programs, they also have major impacts on other economic variables. Section IV discusses the effect of the transfer programs on the performance of the economy. Several indicators of economic performance are used: labor supply, aggregate demand, the unemployment rate, the growth rate, inflation,

and cyclical stability. In each case, the theoretical linkage between the transfer system and the variable is established, and then the empirical evidence on the strength of this linkage is examined.

The income and wage effects of the growth of the transfer programs since the early 1950's have caused labor supply to be about 5 percent less than it would otherwise have been. About 40 percent of this reduction has been among the aged and female family heads. Because the financing of this expansion may have led to some increase in the labor supply of higher income households, the total reduction in labor supply attributable to these programs might have been even less than 5 percent.

For several reasons, the growth of the transfer system has increased the incentives for individuals to remain unemployed longer than otherwise, and for employers to use layoffs and temporary unemployment more often. Empirical studies suggest that these effects have caused the measured unemployment rate to be 1 to 2 percent greater.

Because the growth of transfer programs has involved the redistribution of income from higher to lower income families, and from younger to older persons, the demands for consumption goods and services have changed. Empirical studies indicate that the growth of the transfer system since the 1950's has led to an increase of about 3 percent in consumption spending. In an economy which is not at full employment, this expansion is aggregate demand would be an important stimulus, increasing the growth rate and reducing the rate of unemployment. Had the economy been at full employment, the transfer system would have contributed to some price increase.

The effect of the expansion of these transfer programs on the growth rate of the economy depends on its effect on aggregate demand and savings. The transfer system expands aggregate demand and growth in a situation of less than full employment. Another impact of the system occurs through its effect on savings behavior. Research on this question indicates that, with full employment, private savings are reduced moderately because of the transfer system. Because the economy has operated at less than full employment over much of the last two decades, the increased aggregate demand effect is likely to have exceeded the savings effect.

Furthermore, the growth in transfer programs has led to somewhat higher prices, largely through increasing the demand for medical care services, and reducing the constraints on price increases in this area. On the other hand, the transfer system does provide a substantial cushion against income losses in economic downturns, and hence tends to reduce cyclical instability in the economy. Finally, the paper discusses some potential effects of the transfer programs on other economic variables—locational choices, attitudes toward work, labor market efficiency, and demographic behavior.

Section V gives a rough summary of these effects. The chart presented there states the impact of the growth of transfer programs since 1950, and offers a judgment on the way in which a marginal proportional increase in the system from its present level would affect these variables.

Section VI offers some speculations on the future evolution of transfer programs. We suggest that if no changes are made in current programs, the growth rate of transfer payments is likely to slow relative to the rate of the recent past. If this is the case, the demographic

drift toward a greater proportion of households headed by the young, the old, and females without spouses will lead to increases in poverty and income inequality over the next 10 years. If pretransfer poverty and inequality are not reduced, transfer programs must provide greater amounts of income to these demographic groups to prevent current levels of poverty and inequality from increasing.

We suggest that a restructuring of transfer programs can reduce their adverse efficiency effects, and an expansion of policies designed to increase private sector employment (especially, the employment of low-skilled workers) can reduce poverty and inequality and, at the same time, promote work effort and productivity.

While this is an ambitious agenda, this paper has been limited in a number of ways. First, there are a number of programs or policies which can be considered a part of the Nation's income transfer system which we neither describe nor analyze. Housing, education, and labor market programs are all included in the list of social welfare expenditures compiled by the Social Security Administration. Although public spending on these programs totals nearly $200 million in 1978, they are only mentioned in passing in this paper. A wide array of other implicit subsidies to people occurs through special provisions in the tax law. These "tax expenditures" for income support purposes include tax relief related to earnings (the Earned Income Tax Credit for low-earning family heads), disability status, medical expenses, and housing. Although these provisions account for $50 to $70 billion in foregone tax revenue (depending on how one categorizes them), this paper does not include them. Nor does the paper analyze private transfers, including private pensions, employer-provided health insurance charities, and gifts. This set of income transfer mechanisms is also large and growing rapidly.

Second, in considering the growth of these transfer programs and their economic impacts, we limit ourselves to the past decade or two and to the next. Most of the reliable data on the impacts of the system have been assembled since the beginning of the War on Poverty in 1965. Moreover, there was a rapid growth of these major transfer programs in the last two decades. As to the future the authors are skeptical about trends in income transfer programs, which are extrapolated more than a few years. Hence, except for the implications of demographic changes which have already occurred (e.g., the implications for the Social Security System of declining birth rates and longer life expectancies), this paper does not consider possible long-run changes in these transfer programs or their impacts on the economy.

Third, the effects of the transfer systems which this paper analyzes are the primary economic impacts. Clearly, a wide range of other impacts could have been included—such as the size of government, Federal-State fiscal imbalances, the work ethic, and social cohesion. For many of these impacts, the data and studies necessary to frame an informed judgment are not available.

II. Income Transfer Programs in the United States

A. The Nature of Income Transfer Programs

Government spending for social welfare programs is large, is growing rapidly, and is the subject of perennial debate. These expenditures form the core of the "welfare state." They represent that part of

government activity concerned with securing adequate standards of income, health, nutrition, housing, and education for all citizens as a matter of legal right, not as charity. This social institution is founded on the two beliefs that the state should take an interest in the well-being of its citizens, and that satisfying this responsibility requires direct public intervention to modify the outcomes of unrestrained economic forces.

The Social Security Administration has defined social welfare expenditures (SWE) to include all public programs that provide cash income transfers, food, housing, health services, education, manpower training, employment assistance, and other social services directly to individuals and families. Excluded are community services such as police protection and other government services such as research or regulatory actions. Social welfare expenditures include much more than so-called "welfare" expenditures. "Welfare" expenditures are specifically designed to aid those with low incomes, while SWE include all expenditures in the areas identified—most of which are not designed for the poor alone (e.g., public education).

Since World War II, social welfare expenditures have grown rapidly—from 35 percent of total government spending in 1950, to 56 percent in 1976 (when they cost about $300 billion). While about half of all State and local outlays has gone to SWE over the entire period since 1950, Federal SWE spending increased from 25 percent of all Federal outlays (net of grants to states) in 1950 to 59 percent in 1976.

The share of GNP devoted to social welfare purposes provides the best view of SWE growth. Before 1960, SWE accounted for less than 10 percent of GNP. This figure jumped to 15.9 percent in 1974 and to 20.6 percent by 1976. This last figure may be unusually large, however, because the recent recession led to expanded outlays for unemployment insurance and public assistance.

SWE expenditures can be divided into transfer payments which merely redistribute resources, and resource-using expenditures for which the government directly controls the goods and services purchased. Transfer payments can be further divided into income-tested transfers, which are designed to aid those with low incomes, and other transfers. The analysis in this paper will deal with the major income transfer programs, a large component of total SWE expenditures.

Table 1 lists the major income transfer programs in 1977.[1] The $180 billion of expenditures on these programs accounts for over one-half of all SWE. This total expenditure equals about 7 percent of GNP. These programs are divided into two categories—social insurance programs and income assistance programs.

Consider first the social insurance programs. While each of the programs differs, all share two characteristics. First, eligibility for benefits depends upon past contributions to the program, which is tantamount to working in a job covered by the system. Second, in nearly all cases one must have an identifiable problem—disability, unemployment, old age, death of a spouse—to qualify for benefits. Because of their size and broad coverage, these programs provide

[1] The transfer programs shown here are the major cash and in-kind programs. They are a subset of the more comprehensive list shown in Table 2. This list of major programs is based on tables in U.S. Department of Health, Education, and Welfare, Report on the 1977 Welfare Reform Study, Supplement No. 1, Vol. 2, May 1977. These data differ somewhat from those presented in the National Income Accounts. For example, see Table 3.12, "Government Transfer Payments to Persons," in Survey of Current Business, July 1978.

significant income support to numerous families. About 35 percent of the Nation's households receive income from one or more of these social insurance programs; the mean amount of transfer per recipient household is in excess of $3,000 per year.

The second category of transfer programs is labeled income assistance. These programs do not require past contributions; they are designed to increase the income of those with low earnings or social insurance benefits. These income assistance programs, taken together, form what is often referred to as the "welfare system." They are diverse in their characteristics. Some provide support in the form of cash (e.g., AFDC or Supplemental Security Income (SSI)), while others provide in-kind support (e.g., Medicaid or Food Stamps). Some of the programs are Federal programs (e.g., Food Stamps and SSI), while others are joint Federal-State programs (e.g., AFDC) or State-only programs (e.g., General Assistance). Of the programs listed in the table, only the Food Stamp program provides assistance to all low-income people. Benefits in all of the other programs depend on some characteristics in addition to low income (for example disability, old age, or dependency).

TABLE 1.—*Major income transfer programs, 1977* [1]

	Billions
Social insurance programs	$134.2
Old Age and Survivors Insurance (OASI)	71.0
Disability Insurance (OASDI)	10.9
Unemployment insurance	14.3
Workers compensation	6.7
Veterans compensation	5.7
Railroad retirement	3.6
Black lung	1.0
Medicare	21.0
Income assistance programs	45.7
Aid to Families with Dependent Children (AFDC)	10.3
Food stamps	4.5
Supplemental Security Income (SSI)	6.3
Medicaid	17.2
Veterans pensions	3.1
General assistance	1.3
Housing assistance	3.0
Total	179.9

[1] Fiscal year. Lists of income transfer programs often include government employee pensions. They are not included in this table, but they are included as transfer income in tables 4–13, below. The Department of Health, Education, and Welfare uses this catalog of major income transfer programs. (See footnote 1).

Source: The Budget of the United States Government, Fiscal Year. 1978, Appendix.

At the present time, about 12 to 15 percent of the Nation's families receive benefits from one or another of these programs, and many receive support from more than one of the programs.

The following statements, adapted from a recent government report,[2] characterize the nature and diversity of the major income transfer programs:

> The largest social insurance program, Social Security (OASDI), is the full responsibility of the Federal Government. Benefits

[2] U.S. Department of Health, Education, and Welfare, Report on the 1977 Welfare Reform Study, Supplement No. 1, Vol. 2, May 1977.

are somewhat related to past earnings, and there are no variations from state to state.

The second largest social insurance program, Unemployment Insurance, is left almost completely to the states. Benefits are somewhat related to past earnings, but vary widely from state to state. For example, maximum weekly payments including dependents' allowances range from $63 in Texas to $165 in Connecticut (fiscal year 1977).

One major Federal welfare program, Food Stamps, assures a uniform minimum income for all households with the provision of the benefits in food coupons. States administer this Federal program.

A second Federal income assistance program, Supplemental Security Income, assures a uniform minimum income in cash to aged, blind, or disabled individuals. States are required to supplement benefits to some of these recipients, and may elect to provide additional supplementation. The Federal Government administers the basic Federal benefit and some of the state supplements.

A third major welfare program, Aid to Families with Dependent Children, allows each state to determine how much cash assistance the Federal Government provides and, within some limits, to which citizens. That is, AFDC is an agreement by which the Federal Government provides matching grants to a state for the purpose of assisting it to help the needy population in state-entitlement programs.

The largest welfare program, Medicaid, bases eligibility in most instances on participation in other programs. For example, AFDC recipients are "categorically eligible" for Medicaid. Benefits are in-kind and, as in AFDC, the Federal share varies widely among states.

A "last resort" program for most low-income Americans is General Assistance. This program operates solely at State and local discretion and provides uneven, unsure, and usually temporary income support.

While these various programs are diverse and not well integrated, they are relatively effective in achieving several objectives. The two basic objectives are, first, the replacement of income losses from events which are largely outside the control of individuals and, second, the assurance of a minimum level of economic support to those who, for either defined or undefined reasons, have little other income support. The first objective is largely served by the social insurance programs, which replace income losses from retirement, death, disability, and unemployment. The second is the focus of the income assistance programs, for which inadequate economic means is the chief criterion for support. In a real sense, however, these two objectives are but components of a broader social objective—to reduce poverty and inequality among U.S. citizens. Clearly, without these programs and with reliance on only earned income, savings, or private transfer programs, poverty would be substantially greater and the gap between the rich and the poor significantly larger.

B. The Evolution of Income Transfer Programs

This section briefly describes the evolution of the major income transfer programs.[3] The Great Depression played a critical role in heightening concern for those with low incomes. Because millions were unemployed for long periods, the chances of becoming poor increased, and the causes of poverty came to be seen as systemic rather than personal. In the years before the Depression, many states gradually shifted from haphazard local and private charity toward government-administered income transfer programs. Most had established workmen's compensation and widows' pension plans, and seven states provided some pensions for old age. Thus, it was not surprising that the Depression produced significant new social welfare initiatives.

1. THE SOCIAL SECURITY ACT OF 1935

Enacted by Congress in 1935, the Social Security Act established the basic framework of current income transfer programs. It created five new programs. Two were social insurance programs in which eligibility and benefit levels are related to previous employment and contributions by the worker and/or his employer: Old Age Insurance (OAI) and Unemployment Insurance (UI). Three were welfare programs in which eligibility and benefit levels depend on current income: Aid to the Blind (AB), Old Age Assistance (OAA), and Aid to Dependent Children (ADC). The two social insurance programs were federally financed and administered. The three welfare programs were funded jointly by Federal and State governments (and locally as well in most states at least initially) and administered by states and localities. The Act established the still-important distinctions between types of programs (social insurance or welfare) and level of government authority (Federal or State).

These new programs substantially increased the aid provided to the aged, unemployed, blind, and dependent children. Perhaps even more important, the Social Security Act established a foundation on which other programs could be built.

The Old Age Insurance (OAI) Program encouraged retirement since benefits were generally available only to the semi- or fully retired. Because OAI is a social insurance program, however, coverage depended on previous labor force attachment and benefits were related to previous earnings. People without a sufficient labor market history were not eligible for benefits. The Unemployment Insurance (UI) Program also provided benefits based on previous labor force attachment. UI beneficiaries were, moreover, required to accept suitable employment offers, and benefits were of limited duration. The Aid to the Blind, Old Age Assistance, and Aid to Dependent Children programs provided cash aid without requiring the aged, blind, and mothers of dependent children to work, but (except for female heads of families) there was no cash relief program for the able-bodied poor. Many of these program provisions remain the same today.

The distinction between employables and unemployables was made a foundation of the Social Security Act. The two social insurance

[3] This section draws heavily from Irwin Garfinkel and Felicity Skidmore, "Income Support Policy Where We've Come From and Where We Should Be Going," Institute for Research on Poverty Discussion Paper 490-78, April 1978 (Madison: University of Wisconsin).

programs were designed for employables; the welfare programs were for those with insufficient labor force attachment. This categorical approach, treating different groups of people differently, continues to characterize the U.S. income support system.

The welfare programs in the Social Security Act were expected to decline in importance over time. OAA was to help those aged poor who had not contributed to and were therefore not eligible for the Old Age Insurance Program. As the Old Age Insurance Program matured, it was expected that the number of beneficiaries of the welfare program would dwindle. The welfare programs for both the blind and dependent children were also expected to remain small. Aid to Dependent Children (ADC) was viewed as a program for aiding widows; no one envisioned the growth in marital instability that was to convert the program from a minor, relatively uncontroversial, program into the focal point of the welfare reform debate in the 1960's and 1970's.

The period between 1935 and the War on Poverty was essentially one of legislative quiescence. However, the income support system expanded incrementally: More aid to more groups was provided at increased cost, and the Federal role gradually increased. Expansions included a welfare program, Aid to the Permanently and Totally Disabled, the extension of ADC to the parent of the children, becoming Aid to Families with Dependent Children (AFDC), and a social insurance program, Disability Insurance.

2. THE WAR ON POVERTY AND THE GREAT SOCIETY [4]

Just as the Great Depression accelerated developments in income support policy in the 1930's, a combination of events led to a similar acceleration during the 1960's and early 1970's. The civil rights movement heightened awareness of social injustice and increased the political power of one of the poorest segments of our society. The assassination of President Kennedy created sympathy for implementing social welfare legislation. Within this context, President Johnson declared his War on Poverty in March 1964. The Economic Opportunity Act enacted by Congress later that year established the Office of Economic Opportunity (OEO) and created a series of education and employment and training programs such as Head Start, Job Corps, Neighborhood Youth Corps, Work Study, Upward Bound, and the Work Experience Program for AFDC mothers.

The War on Poverty, in addition to direct program creation, had a profound indirect effect on income transfer programs. By declaring the War on Poverty, President Johnson had elevated the question, "What does it do for the poor?", to a test for judging government interventions and for orienting national policy.[5]

In the years following the declaration of the War on Poverty, several important changes in transfer policy occurred. Expanded benefit levels and coverage of the Social Security program increased the antipoverty impact of the program. By the mid-1970's, the Food Stamp program, begun in 1964 as a program designed primarily to stabilize and support farm commodity prices, had become a $5 billion program of assistance to all low-income families, irrespective of their work status or the

[4] A full discussion and appraisal of the War on Poverty is found in Robert Haveman (ed.), A Decade of Federal Antipoverty Policy (New York: Academic Press, 1977).

[5] Robert J. Lampman, "What Does It Do for the Poor? A New Test for National Policy," The Public Interest, Winter 1974, pp. 66–82.

cause of their meager income. It became, in effect, a negative income tax for food. Similarly, the evolution of health policy took on an anti-poverty character. In 1965, Congress passed the long-debated program of health insurance for the aged, Medicare. Medicaid, passed in the same year, provided health care for the poor. Since their inception, these health care programs have grown dramatically, costing about $40 billion by the late 1970's. Housing assistance for low-income families grew from a relatively small scale before 1965 to a $3 billion program in the 1970's, in part owing to the introduction of new programs.

Additional changes, largely unplanned, occurred in other transfer programs. Aid to Families with Dependent Children and Aid to the Aged, Blind, and Disabled grew enormously during the years after 1965. Federal public assistance expenditures for these programs increased from $2.7 billion in 1965 to nearly $6 billion in 1974, while total program costs rose from $0.7 billion to nearly $15 billion. There were many sources of the increase in costs. They included increased leniency on the part of welfare administrators, expanded rights and entitlements stemming from the initiatives of organized groups of recipients and legal rights activists, more liberal court interpretations of beneficiary rights and entitlements, the raising of state supplemental benefit levels, and reduction in the stigma attached to being on welfare.

The War on Poverty and legislation spawned by it continued the trend toward providing more adequate benefits to an increasingly larger percentage of the population than had been taking place since the enactment of the Social Security Act. In addition to the specific achievements cited above, the emphasis on the commitment to reduce poverty continued to influence a broad array of policy issues throughout the 1970's (e.g., energy policy, tax policy).

3. REFORMS ENACTED IN THE 1970'S

In 1974, the Supplemental Security Income Program took effect as a substitute for the existing adult welfare programs and established for the first time a nationwide, minimum income for the aged, blind, and disabled, set at about 75 percent of the poverty level for a single individual and almost 90 percent for a couple. For the first time, benefits in a welfare program were indexed to the cost of living (Social Security benefits were also indexed at this time). In an attempt to reduce the stigma associated with welfare, the Social Security Administration became responsibile for the administration of SSI.

The Food Stamp program has continued to expand and evolve during the 1970's as the only welfare program entitling all Americans to a uniform nationwide minimum income guarantee—in food coupons. In 1971, Congress amended the Food Stamp program to provide national eligibility standards and benefits, and a work test. In July 1974, it extended the program to all areas of the country and benefits and indexed income eligibility limits to increases in the cost of food. Beginning in 1979, the purchase requirement was eliminated, and participation in the program began to increase once again.

Although both Presidents Nixon and Carter proposed major welfare reforms which were not enacted (the Family Assistance Plan, and the Program for better jobs and income), Congress has continued to expand the number of new programs and coverage under existing programs.

Recent changes include the introduction of the Earned Income Tax Credit in 1974 and its expansion in 1979, the introduction and expansion of public service employment under the Comprehensive Employment and Training Act (CETA), Basic Educational Opportunity Grants, the 1978 Social Security Amendments, and the increase in the number of beneficiaries in various programs for the disabled.

C. The Current Dimensions of Income Transfer Programs

As the discussion has indicated, transfer programs are diverse, broad in coverage, growing rapidly, and complex. Table 2 is an elaboration of Table 1, and provides evidence on expenditure levels in 1965 and 1974. Currently, there are many separate transfer programs which provide significant amounts of income support. Table 2 presents for 1965 and 1974 the estimated expenditures of the most important ones, and for 1974, the percentage of these expenditures received by the pretransfer poor (the pretransfer poor are defined in section III.A).

Several characteristics of these programs should be emphasized. First, the system is clearly a categorical one, with separate programs for single parent families, veterans, the aged, blind, and disabled, the unemployed, and the working poor. Most of this categorization is a response to the work issue—an attempt to distinguish and treat differently those who are expected to work from those who are not.

TABLE 2.—MAJOR INCOME TRANSFER PROGRAMS AND BENEFITS TO THE PRETRANSFER POOR, 1965 AND 1974

[In millions of dollars]

	1965 expenditures	1974 expenditures	Percentage spent on pretransfer poor in 1974
Federal programs:			
A. Social security	$16,488	$53,564	58.8
B. Railroad retirement	1,118	2,671	58.8
C. Railroad disability	44	28	58.8
D. Public employee retirement	3,216	10,776	40.5
E. Unemployment insurance	2,506	5,316	20.8
F. Workers compensation	73	1,237	45.2
1. Regular	73	271	
2. Black lung		966	45.2
G. Public assistance	2,614	6,925	85.9
AFDC	956	4,009	91.8
OAA, AB, APTD, and emergency assistance	1,658	1,047	77.8
3. SSI		1,869	77.8
H. Veterans' income support	4,108	6,763	43.0
1. Compensation and pensions	4,042	6,616	
2. Other	57	103	
I. Food stamps	36	2,718	83.0
J. Housing assistance	227	1,968	65.0
1. Public housing	219	1,233	73.0
2. Rent supplements		137	77.0
3. Home ownership and rental housing assistance, sec. 236		523	46.0
4. Other	2	59	89.0
K. Health	1,990	15,120	58.0
1. Medicare		9,557	59.0
2. Medicaid	271	5,563	73.0
State and local programs:			
A. Public employee retirement	1,861	5,682	40.5
B. Temporary disability insurance	253	481	27.0
C. Workers compensation	1,690	4,152	45.2
D. Public assistance	2,148	5,658	86.1
1. AFDC	768	3,362	91.8
2. OAA, AB, APTD and general assistance	1,379	1,652	77.8
3. SSI		643	77.8
E. Veterans' bonuses and compensation	20	156	43.0
F. Housing assistance	80	545	73.0
G. Medicaid, vendor medical payments	252	4,174	73.0

Source: Sheldon Danziger and Robert Plotnick, "Has the War on Income Poverty Been Won?" (New York Academic Press, forthcoming).

Second, expenditures for the social insurance programs are substantially larger than those for welfare programs, and account for nearly three-quarters of total transfer expenditures. As a consequence, social insurance programs lift more people out of poverty than do welfare programs, even though a larger proportion of the benefits from welfare programs go to the poor.

Third, cash benefits account for a larger share of total expenditures than in-kind benefits, and in-kind welfare benefits exceed both cash welfare benefits and in-kind social insurance benefits.

Fourth, although many people identify the Aid to Families with Dependent Children program with welfare, it actually accounts for only 20 percent of total welfare expenditures and for not much more than 5 percent of total expenditures on income support. By far the largest welfare program is Medicaid.

Fifth, the bulk of income transfer expenditures is financed by the Federal Government. Just as in-kind benefits play a bigger role in welfare than in social insurance programs, State and local financing also play a bigger role in welfare programs than in social insurance. Nearly 30 percent of total welfare expenditures are borne by State and local governments. In contrast, less than 7 percent of total social insurance expenditures are borne by State and local governments.

Table 3 presents evidence on the growth of various income transfers relative to median income, and table 4 shows how transfers are distributed among various demographic groups.

TABLE 3.—GROWTH IN TRANSFER PROGRAM BENEFITS AND MEDIAN INCOME, 1965–77

	Median family income	Average monthly benefits				
		Retired worker	Widow	Disabled	AFDC family	Weekly UI
1965	$6,957	$84	$74	$98	$137	$37
1974	12,902	188	176	206	216	64
1977	16,009	243	222	265	240	78
Percent change 1965–1974	85	124	138	110	58	73
Percent change 1965–1977	130	189	200	170	75	111

Source: "Social Security Bulletin. Annual Statistical Supplement" (Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1978.)

From the data in tables 2, 3, and 4, and from supplemental information, several other summary statements regarding the size and growth of the transfer system can be made:

Since President Johnson declared the War on Poverty, transfer expenditures have rapidly increased due to: (*a*) new programs; (*b*) liberalized eligibility requirements in existing programs; and (*c*) more generous payment standards.

In 1976, 44 percent of all household units received a cash transfer; this transfer averaged $3368 or 24 percent of mean household income. For the aged, 94 percent received cash transfers averaging about 39 percent of their mean income.

Between 1965 and 1976 mean pretransfer income of all households grew by 95 percent while the mean cash transfer grew by 164 percent. The mean public assistance payment grew by 92 percent, the mean Social Security benefit by 165 percent, the mean other government transfer (Unemployment Compensa-

tion, government employee pensions, Workers Compensation, Veterans' Benefits) by 180 percent.

In 1977 there were 28 million recipients of Social Security benefits, 4 million of disability, 11 million of AFDC, 25 million of Medicaid, 18 million of Food Stamps and 4 million of SSI.

Since 1965, the increase in benefits for the aged far exceeded those of welfare recipents or those of the average wage earner.

The gains of welfare recipients who work were substantial, and above the gains in median income.

TABLE 4.—SOURCES OF TRANSFER INCOME, BY DEMOGRAPHIC GROUP, 1965 AND 1976

	Number of households (millions)	Mean pre-transfer income	Mean post-transfer income	Percentage of households receiving social security	Mean social security income	Percentage of households receiving public assistance	Mean public assistance income [1]	Percentage of households receiving other Government transfers [2]	Mean other Government transfers income	Percentage of households receiving any Government cash transfer	Mean Government cash transfer
Total, 1976	78.16	$12,599	$14,087	25.98	$3,206	8.26	$1,944	19.52	$2,536	44.20	$3,368
Families headed by:											
Young men	4.26	11,704	12,141	2.25	2,027	4.67	1,504	23.57	1,359	28.27	1,543
Prime-age men	37.74	18,813	19,718	9.72	3,005	3.48	1,938	21.49	2,539	29.64	3,054
Aged men	6.99	6,694	11,656	91.85	4,251	7.31	1,618	21.81	4,304	94.68	5,240
Young women	.86	2,755	4,403	2.41	2,156	64.01	2,363	7.86	1,055	70.15	2,349
Prime-age women	5.71	7,481	9,382	24.60	3,091	30.34	2,695	16.90	1,913	57.63	3,299
Aged women	1.15	6,855	10,823	91.53	3,158	25.86	1,689	24.10	2,660	97.34	4,077
Individuals who are:											
Young men	2.39	6,333	6,642	2.47	1,712	1.68	1,003	16.32	1,525	19.66	1,568
Prime-age men	5.13	10,331	11,080	7.13	2,530	5.11	1,491	20.85	2,365	29.67	2,526
Aged men	1.56	2,335	5,486	90.05	2,688	14.80	1,043	18.44	3,128	94.15	3,347
Young women	2.03	4,881	5,048	3.72	1,482	3.78	1,294	7.33	857	13.84	1,206
Prime-age women	4.88	6,764	7,531	15.72	2,132	10.16	1,686	11.61	2,244	31.89	2,405
Aged women	5.47	1,913	4,704	90.96	2,481	13.68	1,078	15.43	2,477	95.64	2,913
Total 1965	60 64	6,459	6,905	21.54	1,212	5.15	1,010	17.71	907	37.13	1,275
Families headed by:											
Young men	2.69	5,781	5,857	1.04	529	1.73	599	15.97	373	17.95	420
Prime-age men	35.07	8,699	8,919	6.56	1,022	2.25	965	17.36	780	23.61	950
Aged men	5.79	3,533	5,047	82.12	1,536	6.04	925	26.05	1,391	87.84	1,912
Young women	.27	2,042	2,552	3,54	1,472	39.34	1,160	5.43	274	47.43	1,102
Prime-age women	3.61	3,799	4,651	30.75	1,341	19.67	1,434	18.49	895	55.23	1,557
Aged women	1.04	3,775	4,973	74.10	1,068	18.96	882	25.03	1,178	88.97	1,409
Individuals who are:											
Young men	.40	2,576	2,625	1.89	581	2.04	402	10.53	285	14.49	340
Prime-age men	3.00	4,527	2,744	5.62	1,039	3.02	658	17.64	945	23.77	1,039
Aged men	1.21	1,221	2,261	79.64	1,091	11.68	670	19.17	1,206	88.43	1,333
Young women	.82	1,884	1,897	0.05	229	1.07	580	4.51	148	5.62	231
Prime-age women	3.30	3,431	3,651	12.04	746	3.69	894	11.68	984	22.98	1,034
Aged women	3.43	971	1,927	74.18	903	15.94	817	15.87	1,174	86.46	1,141

[1] Public assistance includes: Aid to families with dependent children, Old age assistance (now supplemental security income), and general assistance.

[2] Other Government transfers include: Unemployment compensation, workmen's compensation, Government employee and veteran's pensions and compensation.

Source: Computations by authors from 1966 Survey of Economic Opportunity and March 1977 current population survey computer tapes.

The growth in the AFDC payment level for those not working was slightly lower than the growth in net earnings for the average worker. But the growth in real economic well-being was greater because of the rapid growth in in-kind benefits from Food Stamps and Medicaid (which are not counted as income in the census data in table 4).

Twenty percent of prime-age (25–64) female heads received public assistance in 1965; 30 percent, in 1976; however, their average transfer went up by only 88 percent, less than the rise in median income.

Among all of the patterns in these tables, the rapid growth of the various transfer programs is the most notable. This growth has several causes. First, the increased affluence of the post World War II period led citizens to revise upwards their notions of what constitutes a minimally decent level of income. As this happened, the willingness to redistribute income to those with the lowest market incomes increased. (However, as we discuss in section VI, the relative constancy of living standards in the 1970's has become a brake on increased spending on transfer programs.)

Also, there is an inherent tendency for certain kinds of income transfers to grow until programs reach maturity. For example, expenditures on Social Security were low for many years because few retired workers had qualified for benefits. Over time, a larger and larger fraction of retirees became eligible for payments and outlays rose. This would have happened even if eligibility rules and benefit schedules had remained unchanged. Finally, several programs were initiated or expanded tremendously after 1965. Medicare, Medicaid, and Food Stamps quickly became major programs in terms of total expenditures and the number of program beneficiaries. Second, Social Security payments grew unusually quickly in the early 1970's, largely because of generous increases in benefit schedules. In a series of measures between 1967 and 1974, Congress increased benefits by 90 percent, while average personal income during this period rose 43 percent.

This rapid growth in the coverage and benefit levels of income transfer programs has had major redistributive impacts on the level of poverty and income inequality and, significant effects on the regional flow of funds. Section III analyzes these redistributive effects. Because transfers have grown more rapidly than earned income, they have also had significant effects on work effort and savings behavior. Section III discusses these and other effects.

III. The Redistributive Impacts of Income Transfer Programs

A. The Poverty Reduction Impact

The Federal Government's official measure of poverty provides a set of income cutoffs adjusted for family size, age and sex of family head, number of children under age 18, and farm-nonfarm residence. The cutoffs provide an absolute measure of poverty which specifies in dollar terms minimally decent levels of consumption for families of different types. For 1976, the official poverty thresholds ranged from $2313 for a single female living on a farm to $9622 for a two-parent family of seven or more persons not living on a farm.

The official income concept is current money income received during the calendar year. This is defined by the Census Bureau as the sum of money wages and salaries, net income from self-employment, Social Security income and cash transfers from other government programs, property income (e.g., interest, dividends, net rental income), and other forms of cash income (e.g., private pensions, alimony). Current money income does not include government or private benefits in-kind (e.g., Food Stamps, Medicare benefits, employer-provided health insurance) nor does it subtract taxes, although both of these affect a household's command over resources. We refer to the official income concept as posttransfer income.

Some writers have argued that absolute poverty thresholds, like the official ones, fail to measure adequately changes in poverty in a society with an increasing standard of living. They conclude that persons whose incomes fall well below the prevailing average in their society are regarded as poor by that society, no matter what their absolute incomes may be. Thus, they advocate relative poverty thresholds which vary directly with average income.

Since concern with income inequality has been increasing, this paper uses relative poverty thresholds in addition to the official ones. The relative poverty thresholds differ from the half-the-median standard offered by some observers. In 1965, the first year for which detailed data are presented, this paper sets the relative poverty lines equal to the official absolute ones. (In 1965, the official lines were equal to about 45 percent of the median income.) In succeeding years the relative lines are increased at the same rate as the median. With this approach, trends in absolute and relative poverty are easily compared because they begin with exactly the same base year population. In applying the relative thresholds, this paper uses the same posttransfer income concept employed by the official measure. Then it applies both the absolute and relative lines to three income concepts in addition to posttransfer income.

Posttransfer income does not distinguish between income derived from market sources (e.g., wages, dividends) and income derived from government sources (e.g., Social Security, Public Assistance income). As such, it fails to separate the market economy's antipoverty performance from the performance of government cash transfer programs. The second income concept, pretransfer income, distinguishes market income from government income. Families and unrelated individuals who do not receive enough money income from market sources to raise themselves over the poverty lines constitute the pretransfer poor (a more exact title would be pregovernment transfer poor). Pretransfer poverty reveals the magnitude of the problem faced by the public sector after the market economy has distributed its rewards. Because pretransfer income is always less than or equal to posttransfer income, using this concept produces a larger population living in poverty.

A related measure of income is prewelfare income. While pretransfer income does not count any money income from government programs, prewelfare income excludes only income from public assistance (i.e., welfare) programs. Social insurance benefits (e.g., Social Security, Unemployment Insurance) are included in prewelfare income because they do not depend on the current income on the recipient. Because

they are based on the past earnings and contributions of the individual and are received because of retirement, disability, unemployment, work injury, or death, social insurance benefits are perceived by the public as earned. Thus for many, the "real" poverty population, the one to whom antipoverty policy should be addressed, is the prewelfare poor.

Both pretransfer and prewelfare income exclude some components of posttransfer income. The fourth concept used in this paper, adjusted income,[6] corrects three flaws in the data used to generate poverty statistics. Each of these flaws biases the measure of the poverty population. First, posttransfer income does not include in-kind income provided by either government (e.g., Food Stamps) or private (e.g., health insurance) sources. Since these benefits increase a family's command over resources, their exclusion leads to an overestimate of the poverty population. Second, many persons misreport their incomes. The official statistics make only a partial correction for this sort of underreporting, so this defect overestimates the number of low-income persons. Third, direct taxes are ignored, so the amount of income available for household consumption spending is overstated. Because the official lines represent the cost of minimally decent levels of consumption, not adjusting for taxes underestimates the size of the poverty population.

The adjusted income concept confronts these three problems. This paper has corrected the data for income underreporting, estimated the amount of in-kind income each living unit received from the three largest government in-kind programs—Food Stamps, Medicare, and Medicaid—and subtracted liabilities from the Federal income and Social Security taxes. These corrections yield a better measure of the income actually available to each household for consumption spending than does the government approach.

Table 5 presents the trend in the incidence of poverty among persons for the various poverty measures. The top panel of the table presents the incidence based on the absolute poverty thresholds; the bottom panel, on the relative poverty thresholds. The columns begin with pretransfer income and end with adjusted income.

Pretransfer poverty.—The size of the pretransfer for poverty population has received scant attention in journalistic accounts of poverty and antipoverty policy, and in scholarly studies and texts, primarily because the data are not published by the Census Bureau. The failure to measure the level of pretransfer poverty obscures the magnitude of the poverty problem the public sector faces after the market has distributed its rewards. To judge the antipoverty effectiveness of government transfer programs, one must compare their outlays to the size of the problem existing before the outlays are taken into account.

A striking observation emerges from column 1 of table 5. The level of absolute pretransfer poverty has been stagnant since 1965. In both 1976 and 1965, 21 percent of all persons were pretransfer poor. Although the incidence for persons was slightly lower in the intervening years, there is no downward trend. Indeed, pretransfer poverty declined to 18.2 percent in 1968; since then, the trend has been slowly upward.

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[6] Our data on adjusted income were provided by Timothy Smeeding. See his article, "The Antipoverty Effectiveness of In-Kind Transfers," Journal of Human Resources, Summer 1977, pp. 360-378.

TABLE 5.—TREND IN THE INCIDENCE OF POVERTY AMONG PERSONS, 1965–76

[In percent]

Type of measure, year	Income concept			
	Pretransfer Income	Prewelfare Income	Posttransfer Income	Adjusted Income [1]
Absolute measure:				
1965	21.3	16.3	15.6	12.1
1968	18.2	13.6	12.8	10.1
1970	18.8	(2)	12.6	9.4
1972	19.2	13.1	11.9	6.2
1974	20.3	13.1	11.6	7.8
1976	21.0	13.1	11.8	6.5
Change, 1965–76	−1.4	−19.6	−24.4	−46.2
Relative measure:				
1965	21.3	16.3	15.6	(2)
1968	19.7	15.3	14.6	(2)
1970	20.8	(2)	15.1	(2)
1972	22.2	(2)	15.7	(2)
1974	22.9	16.1	14.9	(2)
1976	24.1	16.3	15.4	(2)
Change, 1965–76	+13.1	0	−1.3	(2)

[1] Data are for fiscal year 1976 and are roughly comparable with earlier years.
[2] Not available.

Source: Unless noted otherwise, computations by authors from Survey of Economic Opportunity (for 1965) and various March current population surveys (for other years).

The economy's performance at providing above-poverty-line incomes from market sources did not improve in recent years even though the 1965–1976 period was fairly prosperous—average real pretransfer income per capita rose 25 percent. However, most of this growth occurred in the late 1960's; since 1970 the growth of average pretransfer income has been small. Real per capita pretransfer income rose 6 percent between 1970 and 1972, but did not grow at all from 1972 to 1976. Because of this income stagnation, one might not have expected the level of pretransfer poverty to decline. One would not have expected it to increase, however, as it has since 1978.

Prewelfare poverty.—Like pretransfer poverty, the level and trend of prewelfare poverty have not received much attention and are not among the series published by the Census Bureau. In 1965, 16.3 percent of all persons were pre-welfare poor (column 2). Owing partly to a strong labor market and partly to increased social insurance transfers, prewelfare poverty declined to 13.6 percent in 1968. Since 1968, despite the substantial increase in social insurance transfers, prewelfare poverty has not declined; it remained at 13.1 percent in 1976.

Posttransfer poverty.—The incidence of posttransfer poverty (the offical measure) declined by about 25 percent between 1965 and 1976. Much of the decline, however, occurred before the 1970's. Thus, in 1976 11.8 percent of the population was officially poor.

Adjusted poverty.—When the Census data are adjusted for the underreporting of incomes, the payment of Federal income and payroll taxes, and the receipt of in-kind transfers, there is a steady decline in the incidence of poverty. While roughly 12 percent of the nation was poor in 1965, only 6.5 percent was poor in 1976. The contrast with the other trends in the top panel of Table 5 is striking: while pretransfer poverty did not decline, and prewelfare and posttransfer poverty declined somewhat, adjusted poverty was cut in half.

Relative poverty.—For each income concept, the relative measure provides a less optimistic view of the recent past—a higher level and no sign of a decline. Relative pretransfer poverty declined slightly until 1968 and then began to increase; by 1976, 24.1 percent of all persons was pretransfer poor, an increase in the incidence of 13.1 percent. Relative prewelfare poverty and relative posttransfer poverty have fluctuated only slightly during the period, and remain at about 15 percent. This means that the incomes received by those at the bottom have not increased relative to the median income. Rather than lending support to the notion that the War on Poverty has been won, the data on relative poverty suggest that nothing was accomplished, that poverty in America is so pervasive that its elimination requires stronger tactics.

Antipoverty effectiveness.—Table 6 measures the antipoverty effectiveness of tranfers by the percentage of the pretransfer poor removed from officially defined income poverty by transfers. The greater this number, the more successful are transfers. There are, however, two reasons why Table 6 may overstate the antipoverty impact of government transfers. First (as discussed in section IV.A), transfer income tends to reduce the work effort of recipients and their families. When work effort and consequently earnings fall, some persons become pretransfer poor who would have been nonpoor in the absence of transfers. Secondly, transfers influence people's choices of living arrangements. For example, rising levels of Social Security have surely contributed to the decisions of more and more elderly couples to maintain separate households. Because these persons are generally not in the labor force, they are likely to be included in the pretransfer poor. Without this program, or with only meager benefits, many elderly might live with children who earn nonpoverty incomes and would not be included among the pretransfer poor.

Because of these two factors, part of the pretransfer poverty which is calculated to have been eliminated by income transfer programs is, in fact, created by them. The importance of these responses for measuring the antipoverty effectiveness of transfers has not, however, been conclusively established. Our own work in progress suggests that the net decline in absolute poverty due to cash transfers may be overstated by about 5 to 10 percent in 1974, and less in earlier years when transfers were a smaller fraction of personal income.

Table 6 divides all government transfers into social insurance transfers, public assistance transfers, and in-kind transfers. For each type of transfer and for each measure of poverty, public transfers became increasingly effective between 1965 and 1976. While all transfers removed about 43 percent of the pretransfer poor from absolute poverty in 1965, almost 70 percent was removed in 1976. The larger effect is due to the rapid increase in the average transfer benefit received and to the increasing percentage of the pretransfer poor receiving transfers. The fraction of absolute pretransfer poor households receiving a cash transfer payment rose from 69 percent in 1965 to 81 percent in 1976. At the same time, the real value of the typical household's cash transfer grew 34 percent, which exceeded the growth in real pretransfer income. Consequently, more and more households were able to move beyond the official poverty lines.

TABLE 6.—THE ANTIPOVERTY EFFECTIVENESS OF TRANSFERS, 1965 AND 1976

Poverty measure	Percentage of the pretransfer poor removed from poverty by:			
	Cash social insurance transfers [1]	Cash public assistance transfers [2]	In-kind transfers [3]	All transfers
Absolute measure:				
1965	23.5	3.3	16.4	43.2
1976	37.6	6.2	25.2	69.0
Relative measure:				
1965	23.5	3.3	n.a.	n.a.
1976	32.4	3.7	n.a.	n.a.

[1] Cash social insurance transfers include social security, railroad retirement, unemployment insurance, workers compensation, government employee pensions, and veterans pensions and compensation.
[2] Cash public assistance transfers include AFDC, SSI (OAA, APTD, and AB in 1965), and general assistance.
[3] In-kind transfers include the cash equivalent values of medicare, medicaid, food stamps and public housing assistance; this figure also adjusts for the underreporting of cash transfers.

Source: See table 5.

Cash social insurance transfers were over six times as effective in reducing poverty in 1976 (absolute measure) as were cash public assistance transfers. This is so because a greater portion of the pretransfer poor received them, and because the average social insurance benefit was higher. In-kind transfers—which include benefits from both social insurance and public assistance programs—were less effective in reducing proverty than cash social insurance and more effective than cash public assistance transfers.

Table 7 shows that the increased cash transfers were increasingly effective in reducing poverty: 27 percent of the pretransfer poor escaped poverty because of cash transfers in 1965, but 44 percent escaped in 1976. More poor persons received transfers in 1976 than in 1965 (77 percent as compared to 62 percent) and the real value of the transfers grew by more than the rise in per capital income.

The antipoverty effects of government cash transfers differ markedly across major demographic groups and have changed at different rates in the 1965–1976 period. Pretransfer poor persons in households with aged heads have fared much better from transfer programs than have persons in nonaged households. In 1976, 84 percent of poor persons living with aged white male heads and 36 percent of those living with nonaged white male heads rose above the poverty lines because of cash transfers.

It is easy to understand why the transfer system favors the aged pretransfer poor. Social Security benefits, which are largely received by the elderly, have grown enormously since 1965 and now account for about one-half of total cash transfers. The Supplemental Security Income program, implemented in 1974, has further increased the antipoverty impact of transfers for the aged.

TABLE 7.—RECEIPT OF TRANSFERS BY THE PRETRANSFER POOR. ABSOLUTE MEASURE, CLASSIFIED BY HEAD OF HOUSEHOLD, 1965–1976

Groups	Percent pretransfer poor—			
	Persons receiving no cash transfer [1]		Removed from poverty by cash transfers [2]	
	1965	1976	1965	1976
Nonaged white male	59	46	15	36
Aged white male	3	1	67	84
Nonaged nonwhite male	68	43	8	24
Aged nonwhite male	11	4	31	62
Nonaged white female	28	22	27	26
Aged white female	2	1	37	66
Nonaged nonwhite female	26	14	10	16
Aged nonwhite female	6	0	17	42
All pretransfer poor	38	23	27	44

[1] Cash transfers include social security (OASDI), railroad retirement, unemployment insurance, workers compensation, veterans pensions and compensation, Government employee pensions, aid to families with dependent children, supplemental security income (old age assistance or aid to the blind and disabled in 1965) and general assistance.
[2] Defined as (number of pretransfer poor—number of posttransfer poor)/ number of pretransfer poor.

Source: See table 5.

There are also substantial racial differences in the income maintenance system's antipoverty impact. For example, in 1976, transfers lifted out of poverty twice the fraction of white pretransfer poor persons as they did nonwhite. Although the difference remains large, it represents an equalization of transfer effects in the period, from the three to one ratio prevailing in 1965. These racial differentials do not necessarily imply discriminatory transfer programs. Smaller social insurance payments to nonwhites and their resulting smaller antipoverty effects may be due to labor market discrimination. If blacks have lower earnings, and transfers cushion losses of income equally by race, then blacks will get smaller transfers. The improvement in the transfer system's antipoverty impact for blacks since 1965 is probably due to the narrowing of black-white earnings differentials since that time.

Tables 5–7, then, summarize the antipoverty impact of income transfer programs. Increases in government cash and in-kind transfers have produced a decline in the incidence of absolute poverty. However, neither absolute pretransfer poverty nor any of our measures of relative poverty declined. Despite the efforts of the War on Poverty to increase the ability of the poor to earn their way out of poverty, the need for transfers remains high.

Accounting for the trend in poverty: A statistical decomposition.—The observed trend in posttransfer poverty reflects the interaction of three distinct components: the trend in pretransfer poverty, change in the transfer system's effectiveness in reducing poverty, and demographic change in the population. This interaction is illustrated in table 8

with some hypothetical data. The aggregate data show that the posttransfer poverty incidence increased from 6.9 to 7.8 percent between years 1 and 2 because pretransfer poverty increased from 12 to 14 percent, and the antipoverty effectiveness of transfers increased only slightly from 43 to 44 percent. These aggregate data, however, obscure the changes that actually occurred. The detailed data by demographic group (in table 8 there are only two groups) show that pretransfer poverty and the antipoverty effectiveness of transfers remained constant for each group. The aggregate incidence of posttransfer poverty increased only because the demographic composition of the population shifted—in the first year, 10 percent of the persons lived with female heads, while in the second, 20 percent did. Because the incidence of poverty for female heads (30 percent in both years) was above average, this demographic change led to an increased aggregate incidence of poverty.

Because of the interaction demonstrated in table 8, we performed a simple statistical decomposition to test whether the conclusions on the trend in poverty, cited in the previous section, are valid. For each of the three factors, we perform the following experiments—we compute what the level of posttransfer poverty would have been in 1976 if one of the components had remained at its 1965 level. Then we compare this hypothetical posttransfer incidence with the actual 1976 incidence. If the hypothetical incidence is higher than the actual, then we conclude that the change in the component between 1965 and 1976 contributed to a reduction in posttransfer poverty.

TABLE 8.—AN ILLUSTRATIVE EXAMPLE OF THE IMPACT OF TRANSFERS AND OF DEMOGRAPHIC CHANGE ON POVERTY

[In percent]

Year	Demographic composition	Pretransfer poverty	Fraction taken out of poverty by transfers	Posttransfer poverty
	(1)	(2)	(3)	(4)
Year 1:				
Male head	90	10	0.40	6.0
Female head	10	30	.50	15.0
Total	100	12	.43	6.9
Year 2:				
Male head	80	10	.40	6.0
Female head	20	30	.50	15.0
Total	100	14	.44	7.8

Table 9 presents the results. If pretransfer poverty had been constant across demographic groups at the 1965 levels, but if the 1976 antipoverty effectiveness of transfers and the 1976 distribution of the population among demographic groups remained, then posttransfer poverty would have been 13.5 instead of 11.8 percent in 1976. Thus, declines in pretransfer poverty among demographic groups, not revealed in the aggregate data, did occur. Similarly, poverty would have been 15.0 percent if the antipoverty effectiveness of the transfer system had not improved. Thus, both the increase in transfers and the changes in the incidence of pretransfer poverty for specific demographic groups contributed to the decline in the measured poverty.

TABLE 9.—*Actual and Simulated Incidence of Posttransfer Poverty, Absolute Measure, 1976*

Factor Held Constant at 1965 level [1]	Percent
Actual 1965	15. 6
Pretransfer poverty	13. 5
Effect of transfers	15. 0
Demographic composition	10. 3
Actual 1976	11. 8

[1] The simulation is based on a division of the population into eight demographic groups based on the age of head (over 65, under 65), the race of head (white, nonwhite) and the sex of head.

Source: See table 5.

Demographic changes, in contrast, contributed to an increase in the incidence of proverty. If the composition of the population had remained constant across demographic groups (by the age, race, and sex of household head) at its 1965 proportions, then proverty would have been only 10.3 percent rather than the observed 11.8 percent. Demographic shifts toward groups with higher than average incidences of poverty (particularly headed by females) have partly obscured measured progress against poverty. This experiment does not suggest that the "extra poverty" due to demographic change is not real, or that it can be ignored. Regardless of its cause, the actual incidence of proverty is the appropriate measure of the size of the problem. The plight of low income people cannot be minimized by considering it as the result of "just" a demographic shift. Nonetheless, the decomposition provides insight into the sources of the trend in posttransfer poverty. Because groups with higher than average incidences of poverty (households headed by the young, the old, and females without spouses) are growing as a percentage of all households, the aggregate incidence of poverty can be expected to increase over the next 10 years unless transfers become larger and more effective against poverty and/or the labor market yields lower incidences of pretransfer poverty for the specific demographic groups.

B. The Income Distribution Impact

The aggregate distribution of income has remained stable over the postwar period, despite increases in government transfer payments. We use microeconomic data to explore the relationship between income inequality and changes in demographic composition on the one hand and increases in government transfers on the other. Inequality is measured by the Gini coefficient, which ranges from zero (perfect equality of income) to one (total inequality). Thus, a declining Gini coefficient means that the income distribution is becoming more equal and a rising Gini coefficient means the income distribution is becoming more unequal. The population is divided into 12 exhaustive and mutually exclusive groups, distinguished by type of household unit (family or unrelated individual), sex of head, and age of head. The age categories are young (less than 25 years of age), prime-age (25 to 64), and aged (over 65). This decomposition is similar to that for poverty shown in tables 8 and 9.

Substantial demographic change occurred between 1965 and 1974. The total number of household units increased by about 24 percent, from 60.4 million to 74.6 million, while total population grew by only about 10 percent. The largest group, families with prime-age male heads, fell from 57.8 to 51.0 percent of total units. Eight of the other 11 groups, mostly those headed by women and the young, increased.

Families headed by prime-age men had the highest mean income both before and after transfers. Thus, one would expect that the demographic shift toward lower income units would increase aggregate inequality. Tables 10 and 11 confirm this expectation and reveal that inequality increased among families headed by prime-age men as well.

Table 10 presents Gini coefficients for each demographic group for the pretransfer distributions of income in 1965 and 1974. The coefficients range from 0.2846 to 0.7615. The aggregate degree of income inequality rose by 8.1 percent (top row of table). Inequality among families headed by prime-age men rose by more than one-half this amount; inequality declined for five subgroups.

TABLE 10.—INEQUALITY IN THE DISTRIBUTION OF PRETRANSFER INCOME

Demographic group	1965 Gini coefficient	1974 Gini coefficient	Percent change in Gini coefficient [1]
Total population	0.4406	0.4765	8.1
Families headed by:			
Young men	.2846	.2876	−2.1
Prime-age men	.3100	.3245	4.7
Aged men	.6482	.6423	−.9
Young women	.5863	.6453	10.1
Prime-age women	.4832	.5361	10.9
Aged women	.5361	.5672	5.8
Individuals who are:			
Young men	.4574	.4168	−8.9
Prime-age men	.4375	.4539	3.7
Aged men	.7109	.7561	3.7
Young women	.5202	.4508	−13.3
Prime-age women	.4744	.4722	−.5
Aged women	.7433	.7615	2.4

[1] Changes are defined as [(X1974−X1965)/X1965]·(100).

Source: Sheldon Danziger and Rovert Plotnick, "Demographic Change, Government Transfers and Income Distribution," Monthly Labor Review, 1977, (April); 7–11.

Table 11 reveals that posttransfer income inequality decreased for eight of the groups, but not for families with prime-age heads. The aggregate degree of inequality, however, rose by 4 percent. The increase in the aggregate posttransfer Gini coefficient is smaller than the increase in the pretransfer coefficient. This suggests an improvement over time in the equalizing effect of transfers, an issue explored below in greater detail.

TABLE 11.—INEQUALITY IN THE DISTRIBUTION OF POSTTRANSFER INCOME

Demographic group	1965 Gini coefficient	1974 Gini coefficient	Percent change in Gini coefficient [1]
Total population	0.3922	0.4077	4.0
Families headed by:			
Young men	.2876	.2661	−4.5
Prime-age men	.3004	.3040	1.2
Aged men	.4368	.3958	−9.4
Young women	.4378	.4258	−2.7
Prime-age women	.3752	.4061	8.2
Aged women	.4046	.3615	−10.7
Individuals who are:			
Young men	.4453	.4028	−9.5
Prime-age men	.4034	.4065	.8
Aged men	.3778	.4423	17.1
Young women	.5177	.4282	−17.3
Prime-age women	.4234	.4008	−5.3
Aged women	.4163	.3717	−10.7

[1] Changes are defined as [X1974−X1965/X1965]·(100).

Source: See table 10.

Table 12 decomposes the increased inequality of both pretransfer and posttransfer income into components attributable to changing demographic composition and to changing income distributions. For each income concept, the table presents the observed aggregate mean incomes and Gini coefficients for 1965 and 1974 and two standardizations. The standardization of line 2 reveals what the pretransfer Gini coefficient would have been in 1974 if the 1965 demographic composition had not changed but if the 1974 income distribution for each group had still been generated. Line 3 shows what the Gini would have been in 1965 if the 1974 demographic composition had existed along with the 1965 income distribution. Lines 6 and 7 are interpreted identically for posttransfer income.

TABLE 12.—DECOMPOSITION OF CHANGES IN INEQUALITY

	Gini coefficient	Mean income in current dollars
Pretransfer income:		
1. 1974 income distribution, 1974 demographic composition	0.4765	$11,304
2. 1974 income distribution, 1965 demographic composition	.4573	12,053
3. 1965 income distribution, 1974 demographic composition	.4597	6,119
4. 1965 income distribution, 1965 demographic composition	.4406	6,509
Posttransfer income:		
5. 1974 income distribution, 1974 demographic composition	.4077	12,448
6. 1974 income distribution, 1965 demographic composition	.3932	13,202
7. 1965 income distribution, 1974 demographic composition	.4075	6,612
8. 1965 income distribution, 1965 demographic composition	.3922	6,995

Source: See table 10.

The Gini coefficient of line 2 is less than that of line 1, and the mean income is greater. This demonstrates that demographic change during the period increased inequality and reduced mean income. Comparing lines 3 and 4 confirms this result. The Gini of line 1 (line 2) exceeds that of line 3 (line 4) indicating that when the demographic composition is held constant at the 1974 (1965) pattern, changes in income distribution during the period increased inequality. These standardizations show that about one-half of the 8.1 percent increase in the pretransfer Gini coefficient from 0.4406 to 0.4765 cannot be accounted for by demographic change.

The posttransfer Gini coefficient increased from 0.3922 to 0.4077, which indicates that the distribution of posttransfer income became more unequal. Line 6 reveals that if no demographic change had occurred during the period, the Gini would have remained at about its 1965 level. The Gini in line 7 is virtually identical to the actual 1974 Gini, indicating that there were no significant changes in the income distribution. Both of these comparisons show that the 4-percent increase in posttransfer inequality can be accounted for by demographic change, there is, however, no evidence to suggest that inequality would have declined in the absence of demographic change.

In conclusion, demographic change was associated with an increase of about 4 percent in both pretransfer and posttransfer inequality. This accounts for about one-half the increase in the pretransfer Gini and almost all the change in the posttransfer Gini.

Between 1965 and 1974, expenditures on public cash transfers rose from $35 billion to $103 billion. Table 13 examines the impact of the level and rapid growth of transfers in this period. In both years, transfers substantially reduced inequality and raised incomes for several

demographic groups and had a noticeable impact on the aggregate level and distribution of income. As mentioned in the section on poverty when the paper measures the effect of transfers, it compares the pretransfer and posttransfer distributions of income. This method assumes that the level and distribution of pretransfer income are not altered because of the existence of transfer payments. The availability of transfers, however, affects pretransfer income through its effects on labor supply and on household composition. Adjusting for these effects, or for the payment of taxes, was beyond the scope of this paper, but some of these effects are discussed below.

In 1965, transfers reduced the Ginai coefficient by 11.0 percent (increased equality) and raised average incomes by 7.5 percent. These aggregate results obscure a wide variation in the effects among the 12 demographic groups. Transfers slightly altered the level and distribution of income among families with young or prime-age male heads and among young unrelated individuals of both sexes. They reduced inequality by about one-third and raised mean income by about 47 percent for families with aged male heads. For families headed by women of all ages, transfers decreased inequality by more than 22 percent and raised incomes by 23 to 33 percent. Among individuals over 65 years of age, both men and women, transfers doubled incomes while reducing inequality by about 45 percent. The large redistributive impacts for all categories of aged units are attributable to Social Security payments, which account for about one-half of all cash transfers.

In 1974, the aggregate posttransfer Gini coefficient was 14.4 percent less than the pretransfer Gini, a figure that indicates the equalizing effect of transfer payments. The posttransfer mean income was 10.1 percent higher than the pretransfer mean. Again, the transfer system had a small impact on families headed by young and prime-age men and on young unrelated individuals, and larger impacts on the other demographic groups. The 1974 reduction in aggregate inequality and increase in mean income are larger than those changes for 1965 (top line of table 13).

TABLE 13.—IMPACT OF TRANSFERS ON THE LEVEL AND DISTRIBUTION OF INCOME

[In percent]

Demographic Group	1965		1974	
	Change[1] in Gini coefficient	Change[1] in mean income	Change[1] in Gini coefficient	Change[1] in mean income
Total population	−11.0	7.5	−14.4	10.1
Families headed by:				
Young men	−2.1	1.3	−4.5	2.8
Prime-age men	−3.1	2.8	−6.3	3.8
Aged men	−32.6	47.3	−38.4	65.6
Young women	−25.3	25.6	−34.0	44.0
Prime-age women	−22.4	22.6	−24.2	25.0
Aged women	−24.5	32.5	−36.3	51.4
Individuals who are:				
Young men	−2.6	1.9	−3.4	3.0
Prime-age men	−7.8	5.4	−10.4	3.9
Aged men	−46.9	96.0	−41.5	88.7
Young women	−.5	.7	−5.0	3.3
Prime-age women	−10.8	7.2	−15.1	9.3
Aged women	−44.0	100.7	−51.2	152.0

[1] Changes are defined as [(Xpost − Xpre)/Xpre] · (100).

Source: See table 10.

The equalizing effect of transfers in 1974 forms a pattern across the demographic groups that is similar to the one observed in 1965. Among 11 of the 12 household types, the reduction in inequality and the increase in incomes because of transfers were greater in 1974 than in 1965. The consistent pattern probably arises because there were no major structural changes in the transfer system.

Three principal findings emerge:

The aggregate pretransfer and posttransfer degree of inequality increased between 1965 and 1974. The modest increase probably does not signal any disturbance in the post-World-War-II stability of income inequality.

Demographic change accounted for some of the increase in inequality during the period. Economic forces contributed to an increase in pretransfer inequality. Inequality would not have descreased in the absence of demographic change.

Government transfers dramatically reduced inequality for several population subgroups and had a significant impact on the aggregate degree of inequality. This impact increased between 1965 and 1974.

As with poverty, inequality over the next 10 years is likely to increase because of the continued trend toward households headed by the young, the old, and females without spouses. Only declines in income inequality of pretransfer income or increasing transfers to these demographic groups can reverse this demographic drift toward poverty and inequality.

C. The Impact of Federal Income Transfer Programs on Regional Flow of Funds

By far the largest share of income transfer payments is accounted for by Federal Government programs. In 1975, the U.S. Department of Commerce estimated the total volume of transfer payments to be $174 billion, of which $129 billion—about 75 percent—originated from Federal funds alone. These federally sponsored payments differentially affect the level and growth of income among states and regions. Any full assessment of the economic effects of transfer programs must consider this differential flow-of-funds effects.

In table 14, this flow-of-funds impact is shown for the 50 states and eight census regions. In terms of total transfers received, California ranks first with over $13 billion in 1975. Per capita transfers were the largest in the District of Columba (because of Federal retirement payments) and Florida (because of the large number of Social Security recipients) with totals of $1100 and $850, respectively. This compares with an average per capita payment of $600 for the country as a whole.

TABLE 14—REGIONAL FLOW-OF-FUNDS IMPACTS OF FEDERAL INCOME TRANSFER PROGRAMS, 1975

	Transfers from Federal funds (millions)	Per capita Federal transfers	Index of transfer receipts [1]
United States	$129.0	$606	100
New England	7.6	627	100
Connecticut	1.7	550	77
Maine	.7	669	136
Massachusetts	3.8	648	104
New Hampshire	.5	627	114
Rhode Island	.7	717	140
Vermont	.3	592	116

See footnotes at end of table.

TABLE 14—REGIONAL FLOW-OF-FUNDS IMPACTS OF FEDERAL INCOME TRANSFER PROGRAM, 1975—Continued

	Transfers from Federal funds (millions)	Per capita Federal transfers	Index of transfer receipts [1]
Mideast	$26.6	$623	94
Delaware	.3	539	78
District of Columbia	.8	1,113	140
Maryland	2.4	594	89
New Jersey	4.3	582	84
New York	11.2	617	91
Pennsylvania	7.5	640	105
Great Lakes:	22.1	540	85
Illinois	6.2	560	80
Indiana	2.8	519	89
Michigan	4.8	522	83
Ohio	5.9	546	91
Wisconsin	2.5	540	92
Plains:	9.9	594	100
Iowa	1.6	572	91
Kansas	1.4	607	97
Minnesota	2.1	546	91
Missouri	3.1	649	115
Nebraska	.9	585	93
North Dakota	.4	554	93
South Dakota	.4	587	116
Southeast	30.6	641	123
Alabama	2.2	631	132
Arkansas	1.4	673	142
Florida	7.2	858	148
Georgia	2.8	561	108
Kentucky	2.1	621	123
Louisiana	2.0	533	106
Mississippi	1.4	605	144
North Carolina	2.9	527	104
South Carolina	1.6	559	117
Tennessee	2.4	582	116
Virginia	3.2	643	108
West Virginia	1.3	748	147
Southwest	10.9	595	105
Arizona	1.5	683	124
New Mexico	.7	617	125
Oklahoma	1.8	673	124
Texas	6.9	560	96
Rocky Mountain	3.1	547	95
Colorado	1.4	569	92
Idaho	.4	546	102
Montana	.4	575	103
Utah	.6	493	97
Wyoming	.2	513	82
Far West	18.2	633	94
Alaska	.2	560	57
California	13.4	634	93
Hawaii	.5	559	82
Nevada	.3	581	84
Oregon	1.5	648	110
Washington	2.3	657	102

[1] The index of transfer receipt is the ratio of Federal transfer payments received to personal income, as a percentage of the ratio of total Federal transfers to personal income in the United States.

Source: Calculations from data supplied by I. M. Labowitz and U.S. Department of Commerce.

The final column of table 9 summarizes the differential pattern among states and regions by means of a transfers-income index—the ratio of total Federal transfers received to personal income as a percentage of the U.S. ratio. By and large, the index is largest for the poorest states and regions. For example, the Southeast region has an index of 1.23, with no component state having an index below unity. On the other hand, the industrialized Great Lakes region has an index 0.85, with no component state having a ratio in excess of that for the country as a whole. Alaska, Connecticut, and Delaware all have an index value of less than 80 percent of the U.S. average. The states with the largest index values are Florida (1.48), West Virginia (1.47), and Mississippi (1.44). All of these are low-income states.

While these Federal payments favor low-income states and regions, they also tend to favor the fast growing regions of the country. Only two of the regions have an index value in excess of 1.0—the fast growing Southeast (1.23) and Southwest (1.05) regions. Of the 28 states with an index value above 1.0, 15 are in these two regions. Only one state in these two regions (Texas) has an index value less than 1.0.

In sum, then, the Federal transfer system distributes an enormous volume of income—over 10 percent of total personal income—among various states and regions. The states and regions with the most advantageous flows are concentrated among the low-income but rapidly growing sunbelt states. Thus, the Federal transfer system has tended to equalize the regional distribution of income, while contributing to the disparity among states in economic growth rates.

Although not shown in table 14, certain trends in the index over the 1965–1975 decade can be discerned. For most of the States in the Northeast and Midwest, the ratio of transfers to total income increased. This is due largely to relative changes in the denominator of the ratio, as the states in these declining regions lost manufacturing activity and skilled workers to the Southern and Western regions. Also, the recession of 1974–1975 was particularly severe in the Northeast and the Midwest, causing a further decline in personal income, and hence an increase in the ratio. Offsetting these patterns to some extent was the migration of retirees during this decade from the snowbelt areas to the Southeast and the Southwest. Thus, even though total Federal transfers to the Southeast and the Southwest have been increasing more rapidly than those to the Northeast and Great Lakes States, the index value of the snowbelt regions has increased relative to that of the sunbelt regions because of the slow growth in nontransfer income in the high income industrialized regions.

These recent changes, however, say little about the long-term effects of transfers on regional income disparities. Two points seem relevant regarding such long-run implications. First, given the proper character of the transfer system, it will contribute to the disparity in regional income growth patterns as long as the Southeast and Southwest remain poorer than the rest of the Nation. By favoring lower-income families, the system serves as an "automatic convergence" factor in regional income levels. The second point modifies this first point to some extent. Because the Federal transfer system favors lower-income families, it will allocate more to a region with an unequal income distribution than to a second region with the same mean (or per capita) income but a less unequal distribution of income. Because both the Southeast and the Southwest have a greater degree of inequality than the rest of the Nation, the Federal transfer system tends to favor these regions even though their per capital income level approached or equals that of the rest of the Nation. For both of these reasons, then, the Federal transfer system will continue to favor the fast-growing sunbelt regions over the next several years, even though convergence among per capital income levels becomes substantial.

One final note: In the above analysis, the paper has looked only at the flow-of-funds impacts of the transfers themselves, ignoring the source of funds required to finance them. One reason for this is that the tax source of the transfers is complex. Some of them are financed

by the Federal payroll tax and other contributions, while others are funded out of general revenues. If one were to accept the regional flow-of-funds pattern of the entire Federal tax system as a proxy for the flow of funds required to finance only the transfer system, the patterns shown in table 14 would be even more exaggerated. This is so because the Federal tax system is mildly progressive, taking a larger portion of the income of richer than of poorer regions.[7] The *net* flow of funds would then show the Southeast and Southwest to be *net* gainers, and most of the other regions net losers. Again, the lower-income regions and the faster-growing regions would experience net gains and per capita income would tend to converge.

In a recent study, Martin Holmer analyzed the pattern of regional impacts of the transfer system in a more comprehensive framework than that employed here.[8] His model simulates the regional effects of both the transfers and the taxes resulting from a balanced expansion of the transfer system. Thus, his results refer to a marginal expansion of the system, while his paper refers to the annual pattern of flows of the esisting system. Moreover, his model includes the induced consumption and production effects generated by the expansion. In general, his results are consistent with our discussion, although some exceptions are found. For example, the balanced tax transfer expansion resulted in an above average positive labor demand in both New York and New England and a below average impact of California, Texas, and the Mountain States. New York, California, and Texas all experienced a slightly below average index. Neither of the studies, however, attributes a significant role to the tax-transfer system in explaining the historical differences in the patterns of growth among the regions.

IV. The Economic Efficiency Effects of Income Transfer Programs

In addition to affecting the income security of families by reducing poverty, equalizing the distribution of income, and altering regional income patterns and resource flows, transfer policy has a set of more pervasive effects. These effects stem from the changed incomes caused by transfer programs, and the incentives in them for alterations in economic behavior. This paper concentrates on these economic effects, sometimes at a macro-economic level, and sometimes from a more micro-economic perspective. This section explores the linkages between transfer programs and their economic impacts both conceptually and empirically. In the discussion, the available research will be drawn upon to assess the empirical importance of each of these mechanisms and to indicate those issues for which statistical evidence is meager, ambivalent, or lacking altogether. We focus on the interaction of transfer benefits with the rest of the economy: the economic effects of the taxes used to finance transfer programs are not emphasized.[9] Any

[7] See I. M. Labovitz, "Federal Expenditures and Revenues in Regions and States," Intergovernmenta Perspectives, 4/4 Fall 1978: 16–23.

[8] Holmer, Martin, "Regional Economic Effects of the Federal Budget," in William Wheaton (ed.), Proceedings of the Committee on Urban Public Economics Conference on Inter-Regional Growth in American Economy, 1978, Washington, D.C.: Urban Institute, forthcoming.

[9] This neglect of taxation effects is particularly debatable in the case of those transfer programs which are directly financed by earmarked taxes. Over the long run, the financial burden of these taxes will rise and fall with the level of program benefits. In many cases, the economic effects of the taxes will reinforce those of the transfer program (e.g., the labor supply effects of Social Security benefits and the associated payroll taxes); in other cases (e.g., regional flow of funds) the effects may be offsetting.

evaluation of the effects of changing the transfer system however, must simultaneously consider the impact of both the sources and uses of funds.

The most important indicators of the overall performance of the economy are: (1) the level of GNP (and other measures of output or aggregate income); (2) the unemployment rate; (3) the growth rate of GNP; (4) the degree of cyclical stability; and (5) the rate of inflation. We discuss the ways in which transfer programs affect each of these.

A. The Effect of Transfers on the Level of Output

Transfers can influence the overall level of output via two principal channels—by changing the supply of inputs—labor and capital—or by inducing changes in aggregate demand.

1. LABOR SUPPLY EFFECTS

The last decade has produced a large number of studies, based on a variety of data and methods, designed to evaluate the impact of transfer programs on the labor supply of recipients. These studies found that transfer benefits can, and generally do, induce recipients to work less than they would otherwise. In response to transfer benefits, some recipients reduce the number of hours they work; others withdraw from the labor force completely. Less labor supply leads to less production for the market. Less work or labor force withdrawal by recipients could, of course, provide more work for others, but only if there were 100 percent replacement would output not decline. Because both theory and empirical work on this "replacement effect" is minimal, this section concentrates on analyzing the work response of individual recipients to transfer income.

Theoretical considerations.—Understanding the work response to income transfers is difficult for several reasons. One reason relates to the pattern of work incentives which these programs and changes in them create. For example, if the program is income tested so that benefits fall as earnings increase, the realized wage rate from working will be reduced by the program. Moreover, the existence of a transfer program, and even more so of the entire transfer system, cushions any loss of income experienced by a person, whether that loss is voluntray or not. While both the realized wage rate effect and the cushioning effect of income transfer programs imply an adverse effect on work effort (or labor supply, something more fundamental may occur. When an entire system of transfers is put into place, peoples' evaluation of the benefits and costs of working (or working hard), the benefits and costs of entering the labor force early, when young, or leaving later, when old, the benefits and cost of avoiding lay-offs or terminations, the benefits and costs of hurrying back to work when laid off, and the benefits and costs of seeking advancement and promotions may all be altered. These changes involve not only alterations in the reward for or costs of working, but also changes in attitudes toward work and toward various kinds of work.

To evaluate the labor supply effect of income transfer programs or the transfer system itself, then, one must establish a "counterfactual"—an estimate of how much labor supply would occur if the transfer program or the transfer system did not exist. For example, in evaluat-

ing the effect of public retirement benefits on labor supply, one must determine both how much more younger people would work if they knew there would be no public provision for their support after retirement and how much longer older people would continue working (and how much work they would do) if they knew there was no public retirement benefit program or a smaller program. While it is possible to define such counterfactuals, it is substantially more difficult to measure reliably how the world would be if the transfer system were not in place.

Because of the intractability of this counterfactual problem, researchers have by and large focused on a more manageable question. Instead of asking how much the existence of, say, the Social Security system has reduced labor supply in the economy, they have inquired into the effect on work effort of small expansions (or other changes) in the system. The approach has been an incremental one. This paper relies on the results of this incremental approach. However, at the end of the section we will present some speculations on the total effect of the transfer system on work effort.

While changes in almost any provision of a transfer program might affect work incentives of beneficiaries, two key financial characteristics of transfers—the guarantee and the tax rate—are probably most important. The guarantee, which often varies with family size, is the payment to a person who or family that has no other income. The tax rate (or the benefit-reduction rate) is the percentage by which payments are reduced as earnings (or other income) increase. For example, if benefit payments are reduced by 60 cents for each dollar of earnings, the tax rate is 60 percent. In most income transfer programs in the United States, tax rates are positive and rather high: benefits are high when a family has a small amount of pretransfer income, and they fall markedly as income rises. This is true of Aid to Families with Dependent Children, Supplemental Security Income, Unemployment Insurance, and Old Age Insurance for those younger than age 72. In some transfer programs, however, tax rates equal zero; neither OAI benefits for those aged 72 or older nor veterans disability payments are reduced as earnings rise.

Standard economic theory leads to predictions about the way changes in the income guarantee and the tax rate of a program will affect labor supply. A brief description of these predictions is as follows: The income guarantee in a transfer program increases the beneficiary's income opportunities. If the individual prefers to engage in activities other than market work (and his tastes and the wage rate do not change), it follows that increases in transfer income will lead to decreases in market work. Thus, the income guarantees in income transfer programs have an income effect that reduces labor supply. Moreover, the larger the income guarantee, the more the individual can afford to engage in activities other than work and hence, the greater the reduction in market work.

An increase in the tax rate in an income transfer program reduces the reward for working an extra hour. Other things being equal, a decrease in this reward would lead to reductions in market work. This effect of higher tax rates is called the substitution effect. The tax rate in most transfer programs however, not only reduces the benefits of working a marginal hour, but it also reduces the beneficiary's total

income (by reducing his or her transfer benefits). It thus puts the recipient in a position where he or she can less easily afford to work less. Therefore changes in program tax rates have an income effect as well as a substitution effect, and the two effects work in opposite directions. Theoretically, it is not known whether the income effect or the substitution effect associated with a change in the tax rate is more important.

If the guarantee and the tax rate in a transfer program were to increase, the beneficiaries would experience an increase in income opportunities and a reduction in the costs of not working. The combination of the substitution effect (related to the tax rate) and the total income effect (related to both the tax rate and the income guarantee) would tend to induce reductions in labor supply. An increase in only the guarantee of a transfer program would also reduce labor supply. Although the effective wage rate would be unaffected by the change, the individual could afford to work less because of the increase in his income from the larger guarantee. Thus, static economic theory predicts that transfer programs with income guarantees and either zero or positive tax rates will lead to reductions in the labor supply by their beneficiaries. The magnitude of this effect however, is an empirical question, which is discussed below.

Work tests in transfer programs may, in part, offset the effects of the income guarantee and the tax rate on work effort. UI, for example, has a work test. If recipients refuse to search for a job or reject "suitable" employment, they cannot receive benefits. Application of this test surely increases the work effort of some UI beneficiaries above what it would be if their labor supply responses were not so "regulated." Because the line between unemployment and labor force withdrawal is a narrow one for many low skilled, and older workers, the receipt of UI benefits subject to a work test (as opposed to the receipt of benefits without a work test) may lead some to continue searching for employment—and some of those will find a new job. Similarly, required work registration for Food Stamps and AFDC probably prevents some recipients from reducing their work effort as fully as they would in the absence of such a provision.

In addition to this effect on the contemporaneous work effort response of recipients, transfer programs may have an intertemporal labor supply effect. Consider, for example, removing Social Security from an economy in which it is present. If individuals viewed the program as an income guarantee in retirement years, the program may have caused some people to reduce their labor supply and savings (including the purchase of private retirement pensions) in the years before retirement—an intertemporal shift in work patterns attributable to Social Security. Hence, if Social Security is eliminated, people would tend to work and save more before retirement. This added work effort and saving attributable to the elimination of Social Security would, ceteris paribus, tend to induce earlier retirement in later years. In effect, the private savings would have its own "income guarantce" effect on retirement decisions. As a result, the *net* income effect of Social Security on labor supply and retirement decisions would be smaller than that implied by looking simply at its income gaurantee provisions alone.

A second example of the intertemporal shift in labor supply caused by income transfers is also provided by the Social Security system. Because of the high tax rate on earnings after age 65 that is incorporated into the Social Security program, work effort in that age range is discouraged relative to work effort during younger years. In effect, the relative wage rate before retirement rises relative to that in retirement years. There is evidence to suggest that just such an intertemporal labor supply reallocation has occurred because of the program.[10]

Substantial research effort has been devoted to measuring the effects of the various determinants of labor supply decisions. Numerous studies using cross-section data collected from sample surveys have confirmed the theoretical expectation—other things being equal, work effort falls as nonlabor income rises and as the effective (or net) wage rate falls.[11]

Empirical studies.—We now consider the empirical estimates of these labor supply responses. By holding constant, all variables that might affect labor supply except, say, nonlabor income, we can measure the impact of changes in this variable, which can be interpreted as being equivalent to an income effect, on labor supply. Similarly, if we allow only wage rates, as a proxy for the effect of transfer program tax rates on wages, to vary, we can evaluate the substitution effect of transfer programs. A recent study estimates that, for prime-age males, a $1000 increase in nonlabor income is associated with a 1 percent reduction in labor supply.[12] Percentage reductions are greater for aged persons (10 percent) and women and youths (4 percent). For a 10-percent increase in the tax rate of transfer programs, this study indicates a 2-percent reduction in the labor supply of female family heads and a 4-percent reduction in the work effort of wives. The labor supply of men does not appear to be greatly affected by marginal changes in the wage rate.

These results are, by and large, confirmed by the two large-scale experimental studies designed to test the labor supply effects of proposed negative income tax plans.[13] And, as with the cross-section studies, the responsiveness of female family heads and wives is substantially greater than that of husbands.

In sum, the results of these experimental or econometric studies lead to the conclusion that increases in the level of income guarantees or tax rates of transfer programs will reduce aggregate labor supply and the economy's total output.[14] These studies, however, measure changes in labor supply attributable to changes in guarantees or tax rates; they do not lead to any direct conclusions regarding the total effect of the existing transfer system on work effort.

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[10] Richard Burkhauser and John Turner, "A Time Series Analysis of Social Security and its Effects on the Market Work of Men at Younger Ages," Journal of Political Economy, August 1978, pp. 701-716.

[11] For a sample of cross section analyses, see Glen Cain and Harold Watts, Income Maintenance and Labor Supply (Chicago: Markham, 1973).

[12] Stanley Masters and Irwin Garfinkel, "Estimating the Labor Supply Effects of Income Maintenance Alternatives" (New York: Academic Press, 1977).

[13] Recent experimental results are in Harold Watts and Albert Rees (eds.), "The New Jersey Income Maintenance Experiment," Vol. II. (New York: Academic Press, 1978); Michael Keeley et al., "The Estimation of Labor Supply Models Using Experimental Data," American Economic Review, December 1978, pp. 873-887; and Michael Keeley et al., "The Labor Supply Effects and Costs of Alternative Negative Income Tax Programs," Journal of Human Resources, Winter 1978, pp. 3-36. The first reference presents the results from the New Jersey Income Maintenance Experiment, the second two references report on the labor supply results in the Seattle-Denver Income Maintenance Experiment.

[14] This assumes that persons who reduce their labor supply could have uesd it in gainful employment. In an economy with persistent unemployment, this assumption may only be partially correct.

Finally, despite the large number of these analyses, the estimates of the loss of work time and output attributable to the guarantee and tax rate characteristics of transfer programs are still problematic. The empirical results for any demographic group vary substantially with the choice of a data source, the estimation technique, included variables, and other methodological procedures. The substantial differences among these estimates suggest that no firm "point estimate" of labor supply and earnings effects is possible.

Only a limited number of studies have focused on the labor supply effects of existing single transfer programs. Even these, however, have concentrated on the marginal labor supply responses to changes in the guarantee or tax rate of the specific programs, rather than the aggregate reduction in work effort for which they are responsible.

First, consider the Social Security system.[15] As one study suggested, economic research leaves "little doubt that rising levels of other income—and particularly the increases in Social Security benefits and coverage—have played a major role in reducing the labor force participation of older males during the postwar years.[16] This reduction may not have been trivial—while the labor force participation rate of males who are 65 years old or older was 46 percent in 1950, by 1978 it stood at 20 percent. Clearly, Social Security has not been solely responsible for this trend; the growth of pensions, mandatory retirement rules, and private savings have also been important factors. Still, one could reasonably attribute up to one-half of the decline in the older male labor force participation rate to the labor supply disincentives of the Social Security program.[17]

While the absolute decline in work effort (and consequently earnings) of the aged is large, this reduction is rather modest relative to the economy-wide level of work effort and output. Feldstein finds that, in 1970, the labor force was about 3 percent smaller than it would have been, had the participation rates of those over 65 remained at their 1930 levels.[18] Because half this decline may be attributed to Social Security, its aggregate impact has been to reduce the labor force by 1.5 percent.[19] Because earnings of the aged are below average, the percentage loss of output was less—about 1 percent. It should be noted that the labor supply reduction induced by the Social Security retirement program may result in an increased labor demand for new labor

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[15] A review of factors influencing the labor supply of the aged is in Robert Clark et al., "Economics of Aging: A Survey," Journal of Economic Literature, September 1978, pp. 919–962.

[16] William Bowen and T. Aldrich Finegan, The Economics of Labor Force Participation (Princeton: Princeton University Press, 1969), pp. 357–358.

[17] Cross-section studies conclude that the higher one's Social Security benefit, the more likely one is to retire, but these works do not draw out the quantitative implications for changes in participation over the past few decades. Major studies of the relationship between Social Security and labor force participation include: Bowen and Finegan, "Labor Force Participation;" Michael Boskin, "Social Security and Retirement Decisions," Economic Inquiry, January 1977, pp. 1–25; Joseph Quinn, "Microeconomic Determinants of Early Retirement: A Cross-sectional View of White Married Men," Journal of Human Resources, Summer 1977, pp. 329–346; Anthony Pellechio, "The Effect of Social Security on Retirement," unpublished paper, September 1978; and Richard Burkhauser, "An Asset Maximization Approach to Early Social Security Acceptance," Institute for Research on Poverty Discussion Paper 463–77, 1977.

[18] Martin Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation," Journal of Political Economy, October 1974, pp. 905–926.

[19] The observed increase in voluntary part-time employment of the aged, especially its earnings test. More part-time employment does not reduce the size of the labor force, but does reduce hours of work: The one econometric study of this effect examined a special sample of men aged 65–70 who were still working, and estimated that in 1972 the earnings test reduced work effort by an average of 151 hours per year. (Anthony Pellechio, "The Social Security Earnings Test, Labor Supply Distortions, and Foregone Payroll Tax Revenues." National Bureau of Economic Research Working Paper 272, August 1978.) If these estimates are naively projected to apply to all aged members of the labor force, the loss of work hours in 1972 was about 0.3 percent of the national total.

force entrants, making the impact on net labor supply and output still smaller. Moreover, if the suggestion by Burkhauser and Turner, noted above, that this program raised the work week for prime-age men by about two hours, is added to the other estimates, the net loss of total output in the economy due to Social Security probably runs betwen 0.5 and 1 percent.

The Social Security program also provides benefits to aged widows, the disabled and to survivors, and hence is likely to affect the labor supply of these nonaged recipients as well. A relatively small set of studies has focused on the work response of the disabled. The stringent maximum earnings test in the disability program, the need to demonstrate permanent and total disability, and the relatively large income and wage elasticities of the disabled combine to make the labor supply impact of this program a matter of substantial concern.

Consider next the effect of Unemployment Insurance on labor supply. While many diverse estimates have been produced, "the best estimate is that a 10-percentage-point increase in the gross replacement rate . . . leads to an increase in the duration of insured unemployment of about half a week when labor markets are tight.[20] Because the gross replacement rate (the ratio of UI benefits to gross weekly earnings) is usually 50 percent, UI may add 2.5 weeks to the typical spell of joblessness. This, of course, assumes that the statistical results for incremental changes in program benefits can be extrapolated to an estimate of the labor supply results of the program itself. If this effect is summed over all UI recipients, the aggregate impact would be about 0.3 percent of total hours worked in the economy in 1972, Because UI beneficiaries have lower than average wage rates, the loss in aggregate output would be somewhat smaller than 0.3 percent. Note that in making this estimate, the empirical findings on the effects of a marginal change in program benefits on labor supply are extrapolated to the situation in which there is no UI program. Clearly, such an extrapolation is heroic, and is likely to understate—to some unknown degree—the effect of the existence of the program on labor supply.

The third program of particular importance for labor supply is Aid to Families with Dependent Children. Concern about AFDC's inducements to reduce work effort has been a major source of support for welfare reform.[21] The AFDC program, especially when augmented by Food Stamps, often provides a better net income for women with children than full-time work at the minimum wage, and may induce a strong work disincentive. Statistical analyses find that a $1000 rise in the guarantee reduces the employment rate of beneficiaries by 2 to 12 percentage points. For every 10-percent rise in the AFDC tax rate, the employment rate falls by 1 to 3.5 percentage points.[22] Again, it should be noted that these estimates are of changes in labor supply attributable to rather modest changes in program characteristics.

Current research has not identified the declines in aggregate labor supply and production due to the work disincentives of AFDC. AFDC is about one-eighth the size of Social Security in terms of spending.

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[20] Daniel Hamermesh, "Jobless Pay and the Economy" (Baltimore: Johns Hopkins Press, 1977), p. 37.

[21] Masters and Garfinkel, Labor Supply Effects, chapter 8, present and compare results from several studies, and our discussion draws on this material. Although there are many studies of the labor supply behavior of female heads of families using the standard approach that looks at nonemployment income and wage rates, only a few focus explicitly on the effect of AFDC program parameters.

[22] The employment rate is the ratio of persons employed to all persons in a group. We would prefer evidence on the determinants of labor force participation of hours of work, but such estimates are not readily available.

AFDC recipients are probably about as responsive to work disincentives as Social Security beneficiaries, and probably somewhat less productive per hour worked (as measured by the expected wage rates). Taking these factors into account, it seems likely that the overall output effect of this welfare program would be no more than one-eighth of Social Security's. One important difference, however, should be noted. In a world without the Social Security retirement program, people would have made some provision for old age via private retirement programs or savings. As a result, retirement would likely be delayed somewhat, but perhaps not greatly. The situation for AFDC recipients is quite different. They are poor largely because of some unforeseen event for which they could not have planned. In the absence of the program, then, they would be forced into employment at whatever wage rate they could command. The existence of the program, therefore, is likely to account for a larger reduction in labor supply than this extrapolation of incremental changes suggests.

Finally, consider the labor supply effects of transfer programs other than Social Security, UI, or AFDC. While the implicit guarantees and tax rates of Workers Compensation (including the Black Lung program), railroad retirement, veterans pensions and disability compensation, and SSI probably lead to labor supply reductions, their magnitudes have not been carefully estimated. We can, however, suggest some bounds for these effects.

Total outlays for these cash transfers have been well below those for Social Security, and the labor supply of their recipients is likely to be no more responsive to economic incentives than that of Social Security beneficiaries. Thus, the aggregate labor supply and output decline induced by these programs considered together would be much less than Social Security's. At the same time, total payments from these programs exceed spending on UI. Because recipeints of income from these programs are generally less closely tied to the labor market than UI recipients, it is likely that their total labor supply response would be greater.

Food Stamps and several housing assistance programs also have guarantees and tax rates which might induce labor supply reductions, but no empirical estimates are available. Medicare benefits do not change as earnings rise, so the program exerts only an income effect upon beneficiaries. In all likelihood this effect is quite small once one takes into account the effect of Social Security. Similarly, Medicaid benefits do not decline as earnings rise until a family's income reaches the eligibility ceiling. Then all Medicaid benefits are lost. This "notch" surely discourages some persons from increasing their work effort, for a small increase in earnings may cost the family medical care coverage worth hundreds of dollars. As with other noncash transfer programs, the size of this work disincentive has not been identified.

This discussion, then, summarizes the empirical findings on the labor supply effects of changes in transfer program guarantees and tax rates, and provides a few clues regarding the aggregate labor supply effect of these programs. Can anything be said regarding the full response of labor supply to the existence of these programs? While no estimate with statistical confidence limits is possible, a recent study by Robert Lampman has attempted to provide a "guesstimate" of this aggregate impact.[23] The counterfactual to the existing system of transfer

[23] Robert Lampman, "Labor Supply and Social Welfare Benefits in the United States," Institute for Research on Poverty Special Report 22, 1978.

programs and required taxes is assumed to be the system which existed in 1950. Hence the estimate provided relates to the aggregate labor supply reduction caused by the expansion of social welfare benefits during the last 25 years.[24] While rough, this estimate is based on both the estimates from the empirical studies referred to above and the allocation of benefit and tax growth among various demographic groups in the population. It is concluded that the increase in social welfare benefits from 9 percent of GNP to 21 percent in the 1950–1976 period caused the quantity of labor supplied to the economy to be 7 percent less than it would otherwise have been. The percentage breakdown in this aggregate reduction is as follows:

	Percent
Age 62 and over	27
Disabled under age 62	10
Female heads with children	10
Age 18 to 24	14
Other women	34
Other men	5
Total	100

The reduction in labor supply attributed to the "other women" and "other men" categories is mainly due to the higher taxes required to finance the growth in benefits.

This estimate is not inconsistent with the result obtained from summing the separate estimates mentioned in the text. Social Security for the aged reduces work effort by 1.5 percent. Since Disability Insurance and payments to nonaged survivors are about one-seventh the cost of the elderly's benefits, add 0.3 percentage points. UI leads to a decline of about 0.3 percent. For AFDC, taking one-eighth of the Social Security impact gives about 0.3 percent. The other cash programs fall between UI and Social Security; let us say 0.6 percent. The total impact equals 3.0 percent. (It should be noted, however, that the effect on earnings would be less because many transfer recipients have relatively low earnings capacities.) While this 3.0 percent estimate is less than Lampman's, he has considered the effect of all social welfare mates also include the effect of the increased taxes required to finance the growth in transfer programs. The programs he considered rose from 9 to 21 percent of GNP since 1950; our cash transfer programs rose from 3 to 7 percent of GNP.

While the Lampman study appraises the labor supply effects of the expansion of the transfer system since 1950, one cannot rely on it for an estimate of the labor supply effect of an expansion (or contraction) of the system from its current level. Any expansion of the system from its current size would affect demographic groups quite differently than did the expansion from the small and immature system of 1950.

One way of approaching the question of the labor supply response to an expansion of the transfer system from its current size would be to set forth a particular plan, and then to simulate with a micro-data model the labor supply responses of the primary groups affected by the expansion. Researchers at the Department of Health, Education, and Welfare followed this procedure in a recent study.[25] They analyzed

[24] Lampman's estimate is of the labor supply effect of all social welfare benefits (including housing, manpower training, and education programs), rather than just income transfers.

[25] David Betson, David Greenberg, and Richard Kasten, "The Negative Income Tax Versus the Credit Income Tax," prepared for *Conference on Income Tested* vs. *Universal Transfer Programs, Institute for Research on Poverty, Madison, Wisconsin: March 1979.*

both credit income tax (CIT) and negative income tax (NIT) plans which would replace some existing programs and extend benefits to groups not now covered.

With such expansion plans, three groups are affected: (1) Existing transfer recipients; (2) households which become recipients when the new programs are adopted; and (3) households required to pay additional taxes to finance the expansion. The first group is likely to record an increase in work effort because of the change. In the current system they face cumulative tax rates in the 60–80 percent range; the CIT and NIT plans would have a lower implicit tax rate and would neither expand nor contract the income guarantee to any substantial extent. The second group would tend to reduce its labor supply, as the tax rate in the plan would likely exceed the tax rate which the group faced prior to coverage. Moreover, the plan would afford this group an income guarantee which it did not have prior to the expanxion. Finally, the taxpayer group experiences higher tax rates and a reduction in disposable income because of the need to finance the expanded system. While the higher tax rates would tend to discourage work effort (unless the labor supply curve is backward bending), the reduced income would be expected to bring forth additional labor supply. The net effect is uncertain, but could be positive if the income effect is substantial. All of these expected responses are derived from the standard labor supply theory described above.[26]

Consider one of the NIT simulations undertaken by the HEW researchers. In this analysis, it is assumed that a negative income tax with guarantees equal to 75 percent of 1975 poverty level incomes and a benefit reduction rate of 50 percent replace the major income support programs existing in 1975 (AFDC, Food Stamps, SSI, and General Assistance). The Federal cost of this expansion is $16.4 billion, and this cost is financed by an income surtax of 10.3 percent. The effect of this program change on income inequality is substantial—the Gini coefficient drops from the actual level of 0.456 in 1975 to 0.409 with the NIT.

The labor supply effects of this program expansion were estimated with a micro-data simulation model, which incorporated the labor supply coefficients for husbands, wives, and female family heads from the large income maintenance experiment taking place in Seattle and Denver. For the households who would be receiving NIT benefits (groups 1 and 2, above), the expansion of benefits would lead to a 0.2 percent decline in earnings and output. The income tax surcharge, however, would cause an increase in labor supply—mostly among wives—which would result in a 1.2-percent increase in earnings. Hence, the net effect of this particular expansion in the tax-transfer system is an expansion of labor supply sufficient to increase aggregate income by about 1.0 percent. Although this result would imply a backward bending supply curve, it would not be inconsistent with economic theory. Moreover, the overall result would also occur if the simulation were based on other, less extreme, labor supply response coefficients.

[26] Two recent papers have emphasized the importance of distinguishing the impact of expanding income transfer programs on the first two groups. See Giora Hanoch and Marjorie Honig, "The Labor Supply Curve Under Income Maintenance Programs," *Journal of Public Economics*, February 1978, pp. 1–16; and Frank Levy, "The Labor Supply of Female Household Heads, or AFDC Work Incentives Don't Work Too Well," *Journal of Human Resources*, Winter 1979, pp. 76–95.

The results of this and the Lampman study are not inconsistent. Both studies find that the low income population receiving benefits reduces labor supply in response to program expansion. The smaller response reported in the HEW study is due to the nature of the expansion which it analyzes—existing recipients have their tax rate reduced by the policy change, and a number of them experienced a reduction in benefits. Both of these reductions would tend to encourage work effort of individuals who are recipients. On the other hand, the changes analyzed by Lampman uniformly increased the transfer income received by and tax rates facing low-income recipients. The HEW study records the main reduction in labor supply for households which become recipients because of expansion of the transfer system—intact families and higher income families affected by the higher break-even level. Moreover, while the coefficients used in the HEW study to estimate the response of higher-income households to the increased taxes to finance the program were rather large in the basic simulation (especially for wives, who were found to work more in response to higher taxes), Lampman's coefficients were in the other direction—married women work less at lower wages. Because so little is known about the responses of these higher income people, the estimates for this group are highly speculative.

A synthesis of the two results would yield a conclusion along the following lines: Given the nature of the expansion of the social welfare system since 1950, a reduction of labor supply equal to about 7 percent of the potential labor force occurred, largely among those groups which were the primary benefit recipients. Because this reduction is concentrated in relatively low-productivity groups, the reduction in output caused by this expansion is less than 7 percent—perhaps as low as 3 to 5 percent. Moreover, if the current system were simultaneously reformed to reduce the high marginal tax rates on active recipients and expanded, no necessary reduction in labor supply would be expected. Indeed, such a change could lead to a net increase in labor supply and earnings.

2. EFFECTS ON THE LEVEL OF DEMAND

As we have seen, public income transfers accrue largely to low-income households that tend to have a higher than average propensity to consume. Thus, the programs help raise aggregate demand, which induces increased production and a higher level of GNP. This GNP effect is increased by the income stabilization effect of transfer programs. Because transfer benefits reduce income fluctuations, recipients expect a more secure income stream; this raises permanent income and leads to increases in consumption.

No thorough estimates of this aggregate consumption effect are available, but micro-data simulation studies have given some results. In a series of analyses, the authors assumed that Congress legislated a negative income tax to replace the AFDC and the Food Stamp programs.[27] These programs would have increased the size of the

[27] See Frederick Golladay and Robert Haveman, "The Economic Effects of Tax-Transfer Policy" (New York: Academic Press, 1977); Sheldon Danziger and Robert Haveman, "Tax and Welfare Simplification," National Tax Journal, September 1977; and Robert Haveman, Kevin Hollenbeck, David Betson, and Martin Holmer, "A Microeconomic Simulation Model for Analyzing the Regional and Distributional Effects of Tax-Transfer Policy," in Robert Haveman and Kevin Hollenbeck (eds.), "Microsimulation Models for Public Policy Analysis (New York: Academic Press, forthcoming).

Federal income-support system, and the authors assumed, would have been financed by a surtax on Federal income tax. Because of the program, low-income people would have had more disposable income and high-income people would have had less. The analysis indicates that an expansion in the income support system of $1 billion (financed by a Federal income surtax) results in a net increase in consumption spending of about $.45 billion, and a net increase in total production in the economy of $.88 billion.[28]

This increase is due to the tendency for lower-income people to spend more out of each additional dollar of income they receive than is spent by higher income people. These results can ge roughly extrapolated to the entire income support system. If the $180 billion of public expenditures identified earlier were to have the same consumption effects as those identified above, annual consumption spending would be about $80 billion higher than it otherwise would have been. However, the simulated programs analyzed were more highly targeted on poor families with high spending propensities than is the average dollar of actual income transfers. Hence, a reasonable estimate is that consumption spending may be in the range of $40 to $60 billion higher per year because of the existence of the Nation's income transfer system. This represents from 3 to 5 percent of consumption spending in 1976.

Using the same multiregional model, Martin Holmer (cited above) confirms the consumption increase. In his simulation study, Holmer analyses the effect of a $400 million proportional expansion of welfare state benefits and the associated income and payroll taxes. This expansion was estimated to yield an increase in aggregate consumption demand of $72 million, or about 18 percent of the total. This represents a smaller increase, because it is an expansion which is not targeted heavily on low income families. When this percentage is applied to the $180 billion of expenditures in the transfer programs included in this study, it is estimated that a $32 billion expansion of aggregate demand is attributable to the programs. If a multiplier of 2 is assumed, the expansion would be $64 billion, or about 3.5 percent of GNP.

This expansion estimate must be interpreted carefully. In an economy operating at less than full employment, much of this expansion in demand will be reflected in an expansion of both output and employment. As a result, both consumption and savings would grow as a result of the redistribution. On the other hand, if the economy had been operating at full employment without the programs, their introduction would have resulted in increasing prices and, in all likelihood, a substituion of consumption for savings (and investment). Because excess capacity has characterized the economy during much of the period of rapid program expansion, it seems safe to conclude that transfer system expansion has increased consumption demand, and with it total output and savings.

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[28] Implicit in this model is the assumption that low-income households consume a greater portion of their incomes than do high-income households. With this assumption, the reduced inequality caused by expanison of the transfer system would be expected to lead to increased aggregate consumption. Using a life-cycle model with bequests, Blinder has recently shown that income-equalizing transfers need not lead to an increase in consumption spending. See Alan Blinder, "Distribution Effects and the Aggregate Consumption Function," Journal of Political Economy, June 1975, pp. 447–475. Indeed, his empirical results show that equalizing transfers might even decrease consumption spending. Given the weakness to his data and empirical tests, and the counter-intuitive nature of the result, we prefer to rely on what he refers to as the "educated layman's view" rather than that which is "now dominant among macroeconomists."

B. The Effect of Transfers on the Unemployment Rate

The effect of income transfers on the unemployment rate is related to our earlier discussion of labor supply effects, and was partially discussed there. Here, our focus will be on the measured unemployment rate, rather than as labor supply. Transfer policy influences the measured rate of unemployment by increasing time spent searching for new jobs, by subsidizing unstable employment through the experience rating system, and through work requirements. In this section, we will discuss each of these.

Consider first the effect of transfer programs on the time people spend searching for jobs. The income and substitution effect of transfers, particularly UI, allow extended job search, for either better jobs or jobs more suited to skills or tastes. The time spent searching is appropriately counted as unemployment, for it represents a real loss of productive resources (assuming the extra search time is unproductive or at least less productive than returning to work sooner). This increased unemployment occurs among laid-off workers collecting UI, and among other transfer recipients who reenter the labor force.

The second way in which the UI program affects the unemployment rate concerns the demand for labor, and is related primarily to the Experience Rating System of the UI program. The current method of firm experience rating used to finance the UI program raises the net "wage" received by unemployed workers relative to the cost of their unemployment borne by their employers. This encourages businesses to expand the amount of temporary, seasonal, and cyclical fluctuations in their output and employment.[29]

Employers now contribute to their State's unemployment insurance fund on the basis of the unemployment experience of their own previous employees. Within limits, the more benefits drawn by these former employees, the higher is the firm's tax rate. The theory of experience rating is clear: employers are given some incentive to reduce instability in employment patterns. Indeed, if the program required all employers to pay the full cost of the benefits that their employees receive when laid off, unemployment compensation would provide a greater stabilizing incentive. While it would not reduce the duration of unemployment of a person who was changing jobs, it would reduce the frequency and duration of temporary layoffs.

In practice, however, experience rating is an imperfect means of allocating the transfer costs of unemployment to employers responsible for it. Hence, it provides an inappropriately low level of inducements to reduce the instability in employment. The unemployment insurance tax has a relatively low maximum rate and a positive minimum rate. As a result, many firms with high layoff rates have "negative balances" in their accounts, i.e., they have paid less in taxes than their employees have received in benefits. These firms already face the maximum tax rate so increased layoffs do not increase tax payments. Similarly, firms with larger positive balances face the minimum rate even if their layoffs increase somewhat. Because they bear only part of the costs, employers are less likely to organize production and work rules in ways that minimize the instability in employment patterns.

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[29] This analysis has been developed by Martin Feldstein in a series of papers. See his "Temporary Layoffs in the Theory of Unemployment," Journal of Political Economy, October 1976, pp. 937–957.

While the UI experience rating system affects employers, the tax-exempt status of unemployment benefits affects workers.[30] Consider a worker in a seasonal or temporary job or one in a cyclical industry. Such a worker knows that he or she is much more likely to be laid off than a worker with a more stable job. Without UI, workers would only accept unstable jobs if these jobs paid higher wage rates than those of more stable positions. These pay differentials would reflect the chances of being laid off and the expected duration of unemployment. The higher labor costs in unstable jobs would induce employers to reduce instability, and would also increase the output prices of such firms. The higher prices would in turn reduce the demand for such products, further reducing unstable employment. With UI benefits being largely free of taxes, however, the necessary wage premium falls, and its stabilizing effect is lost.

The third transfer effect on the unemployment rate results from the interaction of the definition of unemployment with the work registration/work test requirements of UI, AFDC, and Food Stamps, not from a real loss of productive time by jobless workers.[31] To receive these benefits, one must register with the Employment Service and be willing to accept a reasonable job offer, or risk loss of benefits.

The unemployment rate is calculated from the monthly Current Population Survey (CPS). Although it guarantees a respondent's anonymity, some transfer recipients probably report themselves to the CPS as interested in working even if they really are not, out of fear that their benefits might be canceled. Consequently, persons who are not really in the labor force are counted as unemployed. Because UI, AFDC, and Food Stamps have all recently expanded coverage, this upward bias in measured unemployment is likely to have grown.

UI induces another measurement effect as well. Some people who otherwise would not be seeking work may be induced by the existence of potential UI benefits to enter the labor force. If, as is likely, such entrants have an above average probability of being or becoming unemployed, the overall unemployment rate would be increased.

On the other hand, Social Security benefits and welfare programs such as AFDC, SSI, and Food Stamps might induce some recipients to withdraw from the labor force. In all likelihood, those recipients also have higher than average rates of unemployment. The importance of this effect, which would tend to lower the measured rate of unemployment, has not been explored, and thus will not be examined in our empirical discussion.[32]

In recent years, there has been a substantial amount of empirical research on the unemployment effects of transfer policy. Here, we first summarize evidence on transfers' real effect on the rate of unemployment, and then discuss estimates of their measurement effects.

On the basis of 12 recent studies of the relationship between UI and duration of unemployment, one analyst cautiously concludes that if without the regular UI system the unemployment rate were 7.3

[30] Although the bulk of unemployment benefits received are exempt from income taxes, extended benefits are now subject to some taxation. The receipt of UI benefits may reduce the level of other transfer benefits which the family received. This reduction in other benefits also serves as a "tax rate" on UI benefits.

[31] Kenneth Clarkson and Roger Meiners identified this effect of transfers on the unemployment rate in "Government Statistics as a Guide to Economic Policy: Food Stamps and the Spurious Increase in the Unemployment Rates," *Policy Review*, Summer 1977, pp. 27–51.

[32] See Glen Cain, "Labor Force Concepts and Definitions in View of Their Purposes," Institute for Research on Poverty Special Report 20, 1978, pp. 34, 36.

percent, the rate would increase by 0.1 to 0.2 percent with UI. If the unemployment rate were 4 percent without regular UI benefits, the increase would be about 0.5 percentage points.[33] Another study obtains a comparable result for a low unemployment situation.[34]

Only one paper has estimated the effect of the experience rating provisions which operates through the demand side of the labor market. Hamermesh suggests that imperfect experience rating in the UI program raises the unemployment rate by about 0.1 percentage point at low (4 percent) unemployment rates.[35]

The real effects of transfers other than UI on the unemployment rate have not been investigated. These effects are likely to be much smaller than UI's impact. Many recipients of AFDC, General Assistance, SSI, and Social Security are not in the labor force (in part because of the labor supply effects of the programs) and, thus, program benefits do not affect the rate of joblessness.

Several researchers found that the effect of the registration requirements of welfare programs on measured unemployment was to add about 0.2 to 0.5 percentage points.[36] Hamermesh concludes that the UI work requirement adds an additional 0.5 percentage points to the unemployment rate in times of high unemployment, but has no effect in times of low unemployment.[37] Clark and Summers tentatively find that effect to be as much as 1.8 percentage points in the mid-1970's but conclude that the effect would be smaller at lower rates of unemployment.

Finally, Hamermesh concludes that the entrance of persons into the labor force who expect future UI benefits may add an additional 0.1 percentage points at low levels of unemployment, but that this effect probably disappears at high unemployment rates.

This review of recent studies suggests that the real and measurement effects of the transfer system together add 1 to 2 percentage points to recent reported unemployment rates, depending on whether the smaller or larger estimates of UI's reporting effect are accepted. This impact was smaller before 1973, the year when work registration requirements became important, but it is difficult to quantify the difference.

C. The Effect of Transfers on the Growth Rate of GNP

In its discussion of the effect of transfer programs on aggregate demand, this paper concludes that the expansion of welfare state benefits has increased consumption spending. In an economy with slack resources, this expansion would increase output, employment, and savings. In an economy without slack resources, however, the result would likely be an increase in prices and a substitution of con-

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[33] Hamermesh, "Jobless Pay," chapter 3, finds additional small effects of the emergency UI legislation of 1974–1975.

[34] Irwin Garfinkel and Robert Plotnick, "How Much Does Unemployment Insurance Increase the Unemployment Rate and Reduce Earnings, Work Effort, and Efficiency?" Institute for Research on Poverty Discussion Paper 378-76, 1976. Feldstein finds that UI raises the temporary unemployment rate by about 0.75 percentage points for a special sample of 25 to 55-year-olds. It is difficult to compare this result with that cited in the text because this sample omitted labor force reentrants and those with no prior work experience. See Martin Feldstein, "The Effect of Unemployment Insurance on Temporary Layoff Unemployment," American Economic Review, December 1978, pp. 834–846.

[35] Hamermesh, "Jobless Pay," chapter 4. No estimate is offered for a high unemployment period. This estimate should be regarded cautiously because of possible methodological biases.

[36] Paul Flaim, "Impact of Demographic and Other Noncyclical Factors in the Unemployment Rate," Bureau of Labor Statistics, November 1977, mimeo; Kim Clark and Lawrence Summers, "Social Insurance, Unemployment and Labor Force Participation: The Reporting Effect," Harvard University, May 1978, mimeo. Clarkson and Meiners conclude that the effect was as high as 2 percentage points in the mid-1970's.

[37] Hamermesh, "Jobless Pay." pp. 50–54.

sumption for personal savings. If the induced reduction in personal saving in a fully employed economy occurs without a corresponding shift in public savings or the level of retained corporate earnings, transfers may change the growth rate through their influence on the total level of savings in the economy. Because the rate of new capital investment, which affects economic growth, is related to the economy's rate of saving, transfers may have an effect on the growth rate of GNP.

Much attention has been devoted to the impact to Social Security on savings behavior. The analysis has assumed, at least implicitly, that the economy would be at full employment without the expansion in transfers, already discussing. This is not consistent with this paper's conclusion in the discussion regarding the impact of the system on aggregate demand. This literature identifies three possible mechanisms by which Social Security benefits interact with the savings rate.[38] First, Social Security benefits substitute for private sources of retirement income—they provide an alternative form of "wealth." If increased public savings out of Social Security tax revenue offset reduced private services, the economy would experience no net reduction in saving at all. The Social Security program, however, operates on a pay-as-you-go basis:

Current revenues are almost immediately paid out as benefits, are are not invested. The benefits of Social Security are uncertain, however, as Congress may change them at any time. As a result, they are not perfect replacements for private wealth. If they tend to displace private savings, the effect would probably be less than on a dollar-for-dollar basis. Hence, to some unknown extent, aggregate savings in the economy would tend to fall because of this "wealth replacement effect."

Second, because Social Security's work test encourages early retirement, it may encourage an increase in savings. Early retirement and reduced earnings under partial retirement increase the need for retirement and reduced earnings under partial retirement increase the need for retirement income. As a result, persons may work more, and accumulate more assets during the earlier years of their work life. The increased preretirement savings from this "induced retirement effect" is reinforced by the increased relative wage rate in preretirement years. Noted earlier, this shift in the wage before retirement relative to after retirement could also bring about such an intertemporal labor supply readjustment, leading to increased savings.

Third, private actions might nullify the negative wealth replacement effect discussed in the first linkage. Suppose parents wish to leave a bequest to their children. Given the pay-as-you-go arrangement in the Social Security program, an increase in benefits shifts income from children, who pay the taxes, to parents. Parents may save more to leave larger bequests in an effort to counteract the added tax burden on their offspring. Conversely, suppose parents plan no bequests and, in the absence of Social Security, would expect their children to support their retirement. Then the pay-as-you-go Social Security system simply replaces a pay-as-you-go system of private transfers. There is no impact on savings because no savings for a bequest motive would have occurred without Social Security.

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[38] Feldstein developed the first two in "Social Security, Induced Retirement and Aggregate Capital Accumulation." Robert Barro developed the third in "Are Government Bonds Net Wealth?" Journal of Political Economy, November/December 1974, pp. 1095-1117.

Besides possibly affecting the rate of savings and physical capital formation, transfer policy may influence decisions to invest in human capital through education and training programs. By raising income when earnings are low, a transfer program may increase the demand for schooling. By discouraging work effort through the income and substitution effects already discussed, however, transfer programs may reduce the potential returns from further human capital development and reduce the demand for education and training. The relative size of these two effects—it is not known—will determine whether transfer policy will increase or decrease the demand for schooling.

In recent years, there has been a large number of studies of the effect of Social Security on saving behavior. This paper reports and summarizes the results from five time series analyses of aggregate savings and three cross section studies of household savings rates.[39]

Theoretical analysis suggests that Social Security has ambiguous saving effects. The time-series research contributes to resolving that ambiguity. Because investigators rarely find even a statistically insignificant positive relation between total savings and Social Security benefits, one can conclude that the transfer program does not increase savings. But whether the impact is neutral or negative remains disputed.

Feldstein's estimates were the first in the recent series of studies to be presented. They suggest that each dollar of Social Security wealth (the present value of expected future benefits) increased consumption (and, by implication, depressed savings) by 2 to 3 cents.[40] However, these effects were statistically significant only when the equations eliminated the unemployment rate variable and only when economists analyzed the entire 1929–71 period (omitting the war years 1941–1946). Further, for the 1947–71 period, the effect of Social Security was not statistically significant, though it was positive. Feldstein speculated on the basis of this study that the Social Security system could have reduced private saving by 30 to 50 percent.

Robert Barro analyzed the same basic data as Feldstein, but specified the consumption function (and implicitly the savings function) differently.[41] In his specification, both the unemployment rate and the government budget surplus were included as determinants of consumption. With this specification, Social Security wealth had a positive (negative), but statistically insignificant, impact on consumption (saving) in all of the periods analyzed. For the 1947–1974 period, no significant effect appears even if the unemployment variable is dropped.

Feldstein challenged Barro's specification on theoretical grounds and presented revised and updated estimates to supplement his earlier paper.[42] He incorporated Barro's unemployment variable, but otherwise used his previous specification. In particular, he omitted the surplus variable, arguing that it was endogenous, changing in response to the tax revenues generated by changes in income. He again found a statistically *significant* effect of Social Security on consumption over the total 1929–1940 and 1947–1974 periods.

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[39] A useful review of four of the time-series studies in Louis Esposito, "Effect of Social Security on Saving: Review of Studies Using U.S. Time Series Data," Social Security Bulletin, May 1978, pp. 9–17.

[40] See footnote 38.

[41] Robert Barro, "The Impact of Social Security on Private Saving: Evidence from the U.S. Time Series" (Washington, D.C.: American Enterprise Institute, 1978). Besides using Feldstein's wealth measure, Barro developed an alternative measure of Social Security benefits. It, too, was insignificant.

[42] Martin Feldstein, "Reply," in ibid.

Munnell's estimates used yet a different specification which also included the unemployment rate.[43] On balance, her results offer little support for the savings disincentive hypothesis. While the signs of the coefficients on the Social Security wealth variables suggest some reduction in savings, the Social Security variables were not statistically significant determinants of total savings.

Although Michael Darby develops an alternative consumption function, again there is no evidence of a significant effect of Social Security on savings in the 1947–1974 period.[44] For the full 1929–1940 and 1947–1974 sample, his point estimates do suggest a decline in the savings-income ratio of 20 percent, but the coefficients are not statistically significant.

The last time-series study by Gultekin and Logue experiments in an ad hoc fashion with various specifications of a savings equation for the 1947–1974 years.[45] Their point estimates of the effect of the Social Security wealth variables are larger than any other researcher's, but remain statistically insignificant.

In sum, the time-series studies have examined a wide variety of variables and empirical equations and the results show no statistically significant evidence that Social Security has depressed private savings. On the other hand, the point estimate for the Social Security variable in nearly every equation does indicate a depressing impact. Such consistency is hard to dismiss; in all likelihood there is a small negative effect which time-series analysis cannot isolate precisely.[46]

Like the time-series results, cross section studies have also failed to isolate conclusively the relationship between Social Security and savings. Kotlikoff has conducted the most careful cross-section analysis of this question for a sample of male household heads aged 45–59.[47] He separates each household's net Social Security wealth into two components.

The first component is the present value of past Social Security taxes. If people regard these taxes as forced savings and expect to earn the market return on such payments, they will theoretically reduce private savings. Kotlikoff found that an extra dollar accumulated in one's tax "fund" did reduce asset levels by about 70 cents. Because Social Security benefits are not certain, finding less than dollar-for-dollar replacement is reasonable. This result, however, does not prove Social Security reduces aggregate savings and capital accumulation. It simply shows that a fully funded public retirement program partly substitutes for private choices to save when young and consume when older.

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[43] Alicia Munnell, "The Impact of Social Security on Personal Saving," National Tax Journal, December 1974, pp. 553–567. Munnell covered the 1900–1971 period and sought to estimate Social Security's impact on "retirement savings" as well as on all personal savings. Social Security was found to have a greater effect on retirement savings, but the effect is not statistically significant after 1946.

[44] Michael Darby, "The Effects of Social Security on Income and the Capital Stock," UCLA Discussion Paper 95, July 1977. His consumption function is based on the permanent income model while the others rest on the life-cycle model.

[45] N. Bulent Gultekin and Dennis Logue, in George von Furstenberg (ed.), "Social Security versus Private Saving in Post-Industrial Democracies," proceedings of a conference sponsored by the American Council of Life Insurance, Washington, D.C., forthcoming.

[46] Two comments are in order. First, a fall in savings does not imply an equivalent decline in the capital stock. International capital flows may replace part of the capital investment out of domestic savings. Domestically owned capital will fall if savings fall but domestically used capital may not. Second, changing the Social Security program may not be the best way to raise saving even if its current structure does discourage saving. There are other policies to increase saving and capital formation; these may be more effective. Darby, "Effects of Social Security," concludes that the reduction of the savings-income ratio due to Social Security lies between 0 and 10 percent.

[47] Laurence Kotlikoff, "Testing the Theory of Social Security and Life Cycle Accumulation," Harvard University, 1978, mimeo.

The second component of net Social Security wealth is the difference between the present value of expected future benefits and the present value of past and expected future Social Security taxes. Under existing benefits and tax schedules, this component is positive for most households—they are wealthier because the Social Security system has not been fully funded. Because these wealth increments are unfunded, any reduction in private savings they induce could well mean a decline in real capital formation. The estimates suggest, however, that asset accumulation is not affected by this wealth increment. The coefficient for this variable has a positive sign and is statistically insignificant. Large differences in unfunded or fictional wealth generated by Social Security apparently do not alter savings behavior.

Kotlikoff also finds that, given the choice to retire earlier, persons accumulate more assets. To the extent Social Security encourages earlier retirement, the additional savings induced by this effect partly offset whatever reduction in savings is due to Social Security taxes.[48] The findings by Kotlikoff also must be regarded as tentative. The two components of Social Security wealth are constructed using strong assumptions rather than through direct observation of the data, and there are other technical flaws that may have influenced the results.

Two other cross section studies bear brief mention.[49] Feldstein and Pellechio find that a dollar of net Social Security wealth reduced private savings by about one dollar. Their sample is small however, (138 observations) and they do not separate the wealth variable into the two components suggested by Kotlikoff. Munnell uses the same data base as Kotlikoff and discovers a strong negative effect of private pensions and Social Security coverage on annual savings. Her lack of a precise measure of Social Security wealth, however, precludes isolation of the effect of unfunded benefits.

These cross-section findings are not inconsistent with the time-series work. Time-series data suggest a slight negative impact of transfers on private savings. Available cross section analyses confirm the existence of this impact. They further imply the effect is not created by unfunded Social Security wealth, but by the perceived forced saving of Social Security taxes. Again, there is no consensus on the size of the effect.

These studies focus on the effect of Social Security alone, not on the entire transfer system, on aggregate private savings, and do so in the context of a fully employed economy. In a slack economy, there is no persuasive reason to believe that aggregate private savings would decrease, especially in the presence of the increased aggregate demand which is likely to be induced by the expansion of transfers. Indeed, in the absence of any evidence that transfers "crowd out" investment spending in a less than fully employed economy, the increased aggregate consumption demand discussed above is likely to have stimulated investment spending. Hence, when the negative, though not large, estimates of the impact of transfers on savings are placed in the full employment context and combined with the earlier findings regarding the added consumption spending induced by transfers, the conclusion is that the overall effect of the transfer system on the level of aggregate

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[48] Contrary to most studies, Kotlikoff finds Social Security benefits have no significant effect on retirement decisions. If we accept the consensus finding of some effect, Kotlikoff's results on savings and asset accumulation support the conclusion in the text.

[49] Martin Feldstein and Anthony Pellechio, "Social Security and Household Wealth Accumulation: New Microeconomic Evidence," National Bureau of Economic Research Working Paper, October 1977; Alicia Munnell, "Private Pensions and Savings: New Evidence," Journal of Political Economy, October 1976, pp. 1013-1031.

demand—and hence on the growth rate of GNP—has been slightly positive.

D. The Effect of Transfers on the Cyclical Stability of the Economy

Automatic stabilizers are an important element of Federal fiscal policy. These instruments automatically raise the budget deficit during recessions by either increasing government outlays or decreasing tax revenues. In this way, the deflationary effect of a drop in private spending is partly offset; aggregate demand is kept at a higher level than otherwise and the decline in GNP is reduced. The opposite occurs in a cyclical upswing. Outlays decline; revenues rise; inflationary pressures stemming from excess demand are automatically dampened.

Transfers to persons are among the economy's major automatic stabilizers on the expenditure side. As incomes fall and unemployment rises, UI payments expand. Other transfer programs also help to offset declines in private sources of income during a recession, though to a lesser degree. Cash public assistance and food stamp outlays rise when other incomes fall. A greater number of households become eligible for these benefits and the average payment to those previously on the rolls increases. Social Security and veterans' pensions also have slight countercyclical effects.

Two qualifications to these observations are appropriate. First, it is possible that, in the absence of UI, people would save more during good times to finance consumption when unemployed. To the extent UI replaces such savings, it replaces "natural" stabilizing behavior and its independent stabilization effect would be overstated.

Second, some economists argue that no fiscal policies are effective by themselves, that only changes in the money supply can change real output. If this is correct, automatic stabilizers in fact do not stabilize at all. Because the issue remains unresolved, we proceed under the assumption that fiscal policies are effective.

Most analyses have examined Unemployment Insurance because it is designed to counter fluctuations in earnings. Estimates of the share of personal income replaced by UI benefits range 5 to 30 percent.[50] This rather wide range reflects differences among the studies in methodology and the time examined.[51] Most results, though, fall in the 10–20 percent interval.

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[50] In this discussion, we focus on the fraction of the fall in personal income (as defined in the National Income Accounts) replaced by transfers. This differs from the standard "replacement rate," which indicates the fraction of the recipient's income replaced by one or more transfers. Although the replacement rate is quite useful for evaluating the adequacy of the program in reducing hardship for individual unemployed workers, it is less appropriate in this macroeconomic context. Here we are concerned with the aggregate cushion provided by transfers, regardless of the distribution of benefits arcoss income classes—whether a few recipients have nearly all their lost income replaced (or many have a small percentage replaced), or if there is wide variation in replacement rates. By ignoring these distributional considerations, however, we implicitly assume that the marginal propensity to consume does not systematically vary by income class and, thus, that a dollar of lost income replaced by transfers has on average the same effect on aggregate demand regardless of the recipient. We focus on the share of personal income replaced by transfers, rather than the share of GNP or national income replaced, because transfers are counted in personal income but not in the other indicators.

[51] Hamermesh, "Jobless Pay", summarizes several studies. To make the figures reported more comparable, we transformed each result to measure the percentage of personal income replaced. Also see Edward Gramlich, "The Distributional Effects of Higher Unemployment," Brookings Papers on Economic Activity, 2 1974, pp. 293-336; and "The Cyclical Behavior of Income Transfer Programs: A Case Study of the Current Recession," Technical Analysis Paper 7, Office of Income Security Policy, Department of Health, Education and Welfare, October 1975.

The studies by George von Furstenberg (cited in Hamermesh) and the Office of Income Security Policy both employ 1976 data, but arrive at dramatically different replacement percentages. After our adjustments, von Furstenberg reports about 5 percent while the other reports 33 percent. We have no explanation for the discrepancy.

For several reasons, UI replaces far less than 100 percent of earnings lost due to recessions. Many job losers do not receive benefits because they work in uncovered jobs, have not worked long enough to qualify, or have exhausted their benefits. In addition to inducing layoffs, recessions reduce earnings by shortening work hours (less overtime and more part-time work), but UI generally does not insure against such losses. Also, UI has never been intended to replace all income lost from unemployment; the typical recipient is entitled to a weekly benefit of about one-half his gross weekly earnings.

Two analyses have assessed the degree to which all transfer benefits including UI, respond to income declines.[52] Gramlich found that cash transfers and food Stamps replaced between 10 and 60 percent of a family's personal income losses in 1971. The value varied with the sex of the head and the normal income of the family. For most families, the cushion provided by transfers lay in the 10–20 percent range; it was greater for low income families. Because of the rapid growth of Food Stamps, cushioning is likely to be somewhat larger today. The second study suggested that in 1976 spending on essentially the same set of transfers rose by about 30 cents for every one-dollar fall in personal income.[53]

Leaving aside the question of adequacy, the transfer system serves a significant stabilization function. Currently, a decrease in earned income of $1 induces an increase in cash or near-cash transfer income of from 25–35 cents, with another increase in in-kind benefits of 10–15 cents. However, because changes in consumption spending tend to be less variable than changes in income, the effect of transfers in stabilizing aggregate demand may be less than these replacement percentages suggest.

E. The Effect of Transfers on Inflation

The tie between transfer programs and inflationary pressures is not a close one. As a result, the paper would offer only three comments regarding the contribution of transfers to inflation. First, considered apart from their financing, the expansion of transfer programs increases government spending. Although public deficits need not induce price increases, in some circumstances deficits can contribute to inflationary pressures. Thus, to the extent that the growth in transfers in a full employment context is not offset by increased taxes or reductions in other spending programs, transfer growth may contribute to inflation. Clearly, no estimates or even "guesstimates" are to be had regarding the share of the blame which is to be shouldered by income transfers. Federal transfer policy per se is not an inflationary factor. Although outlays on transfers have grown faster than average, the dollars spent on transfers appear to be neither more nor less inflationary than any other fiscal activity.

Second, to the extent that transfers contribute to labor force withdrawals, to extended periods or reduced intensity of job search, or to the general reluctance to accept employment at lower wages, the growth in income transfers could have contributed to increased wage

[52] Cash transfers include regular UI, AFDC, Social Security, and "other" in Gramlich, but only the first three and General Assistance (not "other" transfers) in the study by the Office of Income Security Policy.
[53] When Medicaid and special unemployment benefits are added, the figure increases to 53 cents.

and price pressures at any level of aggregate demand. This phenomenon is often referred to as a "policy-induced shift in the Phillips curve." And although there is some evidence that such Phillips curve shifts have recently occurred in industrialized Western countries, and that the growth in social welfare benefits has contributed to that shift, there are again no reliable estimates regarding the role that the growth in transfers may have played.[54]

Third, specific features of the two largest in-kind programs—Medicare and Medicaid—have undoubtedly contributed to rapid price increases in the health sector. These programs are not the only causes of the extremely rapid rise in health costs since 1965, but they have contributed in an important way to general inflation.

According to many observers, the key factor behind rising health care costs has been the growth of third-party financing through private health insurance and public programs.[55] About 94 percent of hospital expenses and 70 percent of all personal health care expenses are now covered by third-party payments. In 1950, the corresponding figures were 50 and 32 percent. Moreover, beyond a required "deductible," the out-of-pocket cost of many services is typically zero for most patients. The patient, his/her physician, and the hospital all realize that a third party has an open-ended commitment to pay all or nearly all the costs of whatever services are used.

Given these incentives, patients demand more and higher quality services, even if the added treatments are of little benefit. Extensive third-party involvement increases the amount of resources devoted to health care, and exerts pressure on medical care prices. Total costs rise more rapidly than if patients and doctors faced prices that more closely reflected the real total costs of their decisions.

Statistical evidence supports this logic. Most empirical research shows that the out-of-pocket price of medical services influences the amount of care demanded.[56] By extending cheap or free insurance to the elderly and certain groups among the poor, Medicare and Medicaid have both been important factors in reducing this price by accelerating the growth of third-party financing. Between 1965 (the year before these programs began) and 1977, the Federal share of total personal health care costs rose from 9 to 28 percent. Medicare and Medicaid now pay over 25 percent of all personal health costs and about one-third of hospital charges. Beneficiaries were encouraged to demand more and better services, while providers were free to incur higher costs without worry that patients would either resist or be unable to pay. Unfortunately, however, the precise increase in the rate of inflation caused by the programs has not been identified, as other developments such as rising personal incomes and improved private health insurance coverage have also helped generate price increases.

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[54] Robert Haveman, "Unemployment in Western Europe and the United States: A Problem of Demand Structure, or Measurement?" American Economic Review, May 1978, pp. 44–50.

[55] The discussion which follows is largely drawn from Louise Russell, "Medical Care Costs," "Setting National Priorities, 1978" (Washington, D.C.: Brookings Institution, 1977). See also Michael Zubkoff (ed.), "Health: A Victim or Cause of Inflation" (New York: PRODIST, 1976). Figures for 1977 come from Robert Gibson and Charles Fisher, "National Health Expenditures, Fiscal Year 1977," Social Security Bulletin, July 1978, pp. 3–20.

[56] For a review of many studies, see Martin Feldstein, "Econometric Studies of Health Economics," in M. Intriligator and D. Kendrick (eds.), "Frontiers of Quantitative Economics," vol. 2 (Amsterdam: North-Holland Publishing, 1974), pp. 377–434. Also see Karen Davis, "Hospital Costs and the Medicare Program," Social Security Bulletin, August 1973, pp. 18–36; Zubkoff, "Health"; and Joseph Newhouse, Charles Phelps, and William Schwartz, "Policy Options and the Impact of National Health Insurance," New England Journal of Medicine, June 1974, pp. 1345–1359.

The impact of Medicare and Medicaid on the overall Consumer Price Index has been small, even though the effect on medical costs has been substantial. If these programs were solely responsible for the above average inflation rate for medical expenses, they would have contributed .05 percentage points to the average annual rate of overall price change of 6.1 percent from 1967–76. It is difficult however, to allocate changes in the price index among components—changes in relative prices imply little about inflation.

F. Other Economic Effects of Transfer Policy

In addition to these economic impacts, transfer policy may produce various other important social and economic effects. The focus here is on the possible relationships between transfers and (1) demographic decisions, including choice of living arrangements and marital status; (2) locational choices; (3) attitudes toward work; and (4) the efficiency of labor markets. Because empirical work on these questions is either nonexistent or inconclusive, we present only a review of the issues.

1. DEMOGRAPHIC DECISIONS

Any transfer program can influence decisions about living arrangements or whether to divorce or remarry in two ways. Programs that increase the income available to the whole living unit may reduce personal tensions created by economic problems, and promote greater family statibility. For example, UI benefits or Food Stamps alleviate financial pressures that otherwise might rupture a marriage.

Secondly, some programs extend actual or potential benefits only to some members of the household. This independent source of income or the prospect of such support exerts an "independence effect," that allows the actual or potential recipients to live separately from the rest of the family. For example, elderly persons or couples may choose to live alone instead of with their children if their Social Security benefit (plus other income) is sufficient. An unmarried youth's UI may permit him to remain independent during a period of joblessness. Similarly, the AFDC benefits which a woman with children may potentially receive may lead her to leave her husband, converting the potential benefit into an actual one. Conversely, a divorced woman with children may be less likely to remarry because of AFDC's independence effect. These last two examples illustrate how transfer eligibility rules, as well as the benefit level, can affect demographic choices.

Another demographic issue concerns the pro- or anti-natalist effects of income transfer programs. To the extent that such programs are conditioned by family size, or require the presence of children in the home for the family to remain eligible for benefits, they could increase birth rates. Because many of the welfare programs in the income support system have these family-size characteristics, there has been a good deal of speculation about their pro-natalist incentives and effects, but the empirical evidence suggests that these are not large.

In short, transfer policy can change the financial benefits and costs to those contemplating household composition changes, and, by doing so, tip the incentive toward certain types of living arrangements or family sizes and away from others. Naturally, decisions on these personal matters are motivated by far more than financial incentives, but it is equally true that economic variables can have an identifiable impact of their own.

2. LOCATIONAL CHOICES

Certain transfer benefits, notably Social Security and other retirement pensions, are not dependent on where one lives. The sharp rise in payments from these programs has permitted many older people to move to geographic areas that they find more desirable. Population shifts toward the sunbelt and rural recreation areas are partly due to this separation of income from locale.

Transfer benefits that vary from state to state may also affect migration decisions. Some analysts suggest that states with relatively large welfare benefits attract some low income persons for this reason. Greater benefits offer the prospect of increased income to persons looking to live off welfare. And for those intending to work, larger benefits will provide a better cushion in case they experience poor earnings.

3. ATTITUDES TOWARD WORK

As discussed earlier, transfer benefits have the direct effect of reducing work effort. Over the long run, then, the continued existence and availability of income support programs might induce a decline in the work ethic. Conversely, the boost in the level and security of living which income support policies give to poor families may have a positive long-term effect on their physical and mental health, and also on their motivation and energy levels arising from improved nutrition and living environments. Income transfers may, as a result, improve the quality of labor. Ascertaining such a cause and effect relationship is virtually impossible. Nonetheless, arguments of this sort lie behind public debate on proposals for universal income support plans and employment strategies to assist able-bodied transfer recipients.

4. LABOR MARKET EFFICIENCY

We have already identified mechanisms by which transfers might interfere with functioning of labor markets by offering incentives to work less, remain unemployed longer, or expand the number of unstable jobs. Such behavior makes labor markets work less efficiently. Two ways in which transfers, especially UI, can improve the efficiency of labor markets are discussed here.

It is widely recognized that specialization of both workers and machinery raises productivity. However, specialization may be risky.[57] If the demand for one's special skill declines and one's job disappears, it may be difficult to find other work. Insurance against the higher risk of earnings loss that accompanies specialization can encourage specialization and its economic benefits. Unemployment Insurance provides such a system. The earlier attention to the work disincentives of UI ignored what may be a far more important contribution.

UI also allows some umemployed persons to conduct more effective searches for new positions. Benefits reduce financial pressure to take a job as soon as possible, permit the recipient possibly to find better employment or to relocate, and, thus, improve the match between workers and jobs produced by labor markets. This improvement in the allocation of labor may partly or wholly offset the loss of output resulting from increased search time. Similarly, new entrants or

[57] This argument is developed in Frank P. Stafford, "More on Unemployment Insurance as Insurance," Industrial and Labor Relations Review, July 1977, pp. 521–526.

reentrants to the labor force who are collecting other transfer benefits such as AFDC may find more productive jobs by being able to search more carefully.

V. The Economic and Redistributive Effects of Transfers—A Summary Scorecard

The discussion in sections III and IV traced the effect of the transfer system on a wide range of other phenomena—poverty, income inequality, regional growth, output and its growth, unemployment, stability, and several other economic variables.

Table 15 draws together much of our discussion of the various economic effects of transfers by offering a rough evaluation of their importance. No simple schema such as this can convey a full evaluation Our objective is to summarize the general evaluation reached in the discussion in the text. Hence, the entries in the table reflect our reading of the empirical evidence and our value judgments. The first column compares the effects of the current set of transfer programs and the requisite financing of these programs on a number of variables. The counterfactual is a transfer system of the real size and composition of that existing in 1950. For example, the entry in column one for income poverty indicates the difference between the actual current value of this variable and the value which the variable would have currently if a transfer system of the real size and composition of that of the early 1950's existed today. The second column reflects our judgment regarding the change in the current situation which would result from a small—perhaps, 3–5 percent—proportional expansion in expenditures on the set of transfer programs studied here. This impact might be of a quite different sort from the impact in column one, insofar as the growth in the system since the early 1950's was not proportional to the structure of the system that existed at the beginning of the 1950's.

TABLE 15.—REDISTRIBUTIVE AND ECONOMIC EFFICIENCY IMPACT OF INCOME TRANSFER PROGRAMS[1]

	Effect of transfer programs, relative to 1950 system	Effect of marginal expansion, relative to current system
Income poverty	Reduction by 50–60 percent	Not large, as most easy gains have been had.
Income inequality	With current system, income is substantially less unequally distributed.	Some additional reduction, as programs provide most benefits to below-median income households.
Regional income differences	Moderate contribution to reduction in differences.	Small reduction, given reduced size of existing differential.
Regional growth differences	Small contribution to more rapid sunbelt growth.	Small increase in north-south differences.
Labor supply	Reduction by about 4 percent	Neutral; perhaps slight increase.
Unemployment rate	Increase by at least 1 percentage point	Do.
Saving	Modest reduction, assuming full employment; otherwise an increase.	Neutral; slight expansion if less than full employment.
GNP growth	Modest reduction assuming full employment; otherwise an increase.	Do.
Inflation	Modest increase, largely through medical prices.	Neutral; perhaps slight increase.
Cyclical stability	Moderate increase	Slight increase.

[1] This table excludes the other economic effects of income transfers which the text discusses because there is no firm empirical evidence on the direction and magnitude of the effect.

Although it is useful to view the effect of the transfer system on a number of individual economic and redistributive goals, it must be emphasized that trade-offs among these goals exist. Transfer policy may contribute toward improving one macroeconomic goal at the

expense of worsening either another or some nonmacroeconomic objective. For example, actions to minimize the loss of output and the induced increases in unemployment conflict with efforts to improve the stabilizing effects of transfers.

Reducing transfer benefits encourages a quicker return to work and induces smaller labor supply responses. But such a change means that transfers offset a small proportion of any income decline and are weaker stabilizers. Similarly, providing larger benefits, enhances income security, but may discourage work effort.

The effects discussed above, and illustrated in the table, indicate that these trade-offs exist. The impact of the current transfer system is generally positive for equity issues (e.g., the reductions in poverty and inequality among individuals, and the promotion of income convergence among regions), but somewhat negative (or at least neutral) for efficiency issues (e.g., the reductions in labor supply and savings).

VI. The Next Decade of Income Transfer Programs

This concluding section includes recent developments in income transfer programs and economic trends. We note the recent emphasis placed on employment-oriented programs in the income support system. Unless changes in this system are implemented, poverty and income inequality will increase. Here we suggest that the most feasible ways to reduce poverty and inequality while maintaining work effort and productivity may be to emphasize the expansion of labor market rather than transfer programs. Much of this discussion is speculative, and reflects our perception of both underlying attitudes toward income transfers and employment programs and the efficiency and equity effects of the current set of programs.

A. Recent Developments

In previous sections, we have documented the evolution and nature of income transfer programs and their redistributive and economic effects. We concluded that these programs reduced poverty and income inequality significantly; reduced regional income differences, output and employment slightly; widened disparities in regional growth rates to a small extent; and affected aggregate demand and economic growth in ways that are less clear.

In recent years, policy attention has focused on improving the operation of the income-tested transfer programs and the equity of their impacts on various population groups. The most recent of these "welfare reform" efforts were the 1977 proposal by President Carter for a Program for Better Jobs and Income, and his May 1979 welfare reform proposals.

Since the problems of the current welfare system have been evaluated and catalogued numerous times, our discussion will be very brief. First, the existing welfare system is inequitable. It treats people who have similar needs differently. A single-parent family of four living in Mississippi was entitled to $3071 in AFDC and Food Stamps in fiscal year 1978, while a similar family living in New York was eligible for $7354. In addition to the inequity itself, these geographic disparities tend to encourage migration from low-benefit to high-benefit states. Secondly, welfare treats differently people who have similar

needs but live in different types of families. In any of the 25 states and Puerto Rico which do not have an AFDC program for unemployed parents, a family with two parents but no earnings becomes eligible for AFDC benefits only if the father deserts the family. If the father stays with the family, it will be eligible only for Food Stamps plus, in some jurisdictions, General Assistance.

Besides discouraging marital stability and encouraging migration, the current system discourages work. As we have analyzed in section IV, the reward from working is diminished because of the income and substitution effects of the programs. Because some families participate in two or more of these programs at the same time, the total loss in benefits caused by an increase in earnings may almost completely offset that increase. In other cases, an individual's income is higher without work than with a job.

Finally, each of the welfare programs has different operating rules. In a single household, one person may receive Food Stamps and AFDC benefits while another receives Food Stamps and SSI benefits. Since each program has different rules, different accounting periods, and different notions of the filing unit, administration is complex. Many of the poor may not receive benefits which they need and to which they are entitled.

In August 1977, President Carter announced his welfare reform plan—the Program for Better Jobs and Income (PBJI).[58] The plan would have consolidated three major components of the current welfare system and provided a Federal, nationwide, minimum cash payment for all the poor. It also pledged to provide as an integral part of the welfare system a public service job for some of those able and expected to work. Earnings, welfare, manpower policy, and taxes would have been interrelated through an expanded Earned Income Tax Credit and a new, nationally uniform system of basic income support payments. These aspects of the proposal served explicit notice that the income support system can and will no longer be adjusted without careful consideration of the operation of labor markets.

Proponents claimed that, compared with the current system, large gains were possible from PBIJ. (*a*) Welfare would have been integrated with earnings and both coupled with the tax system. (*b*) Consolidation would have streamlined administration. (*c*) Persons at work would always have had more income than those on welfare. (*d*) Family stability would have been enhanced by allowing married couples with children to benefit in the same manner and to the same extent as single-parent families. (*e*) The relatively high national minimum payment would have reduced incentives for migration from low- to high-benefit states. (*f*) States and localities would have received fiscal relief.

Although many current recipients who do not work would not have benefitted under the Carter plan, the expansion of cash benefits to all persons would have increased the incomes of many who are currently ineligible for cash assistance—childless nonaged couples, unrelated individuals, and two parent families in states without an AFDC program for unemployed parents. These persons are currently eligible only for Food Stamps, and possibly for Unemployment Insurance and General Assistance.

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[58] The Program for Better Jobs and Income is assessed in Sheldon Danziger, Robert Haveman, and Eugene Smolensky, "The Program for Better Jobs and Income—A Guide and Critique," U.S. Congress, Joint Economic Committee, February 1978 (also available as Institute for Research on Poverty Reprint 259).

For those who worked, PBJI represented a significant departure from previous welfare policies. Because the program emphasized the provision of jobs and the supplementation of earnings, all those who worked at low wages, regardless of family composition or region of residence, would have had higher incomes and in many cases would have risen from income poverty.

In keeping with its precedents, however, Congress chose to set aside comprehensive welfare reform in favor of enacting selective components of the reform plans. PBJI was thus rejected. In 1977 and 1978, the Comprehensive Employment and Training Act (CETA) rapidly expanded public employment. Many of these jobs were filled by those who would have received jobs under PBJI. At the present time, Congress is considering an incremental welfare reform plan proposed by President Carter in May 1979. It is embodied in the Social Welfare Reform Amendments of 1979 and the Work and Training Opportunities Act of 1979.

The Tax Reform Act of 1978—considered by many as a regressive departure from the recent direction of tax reform—picked up on PBJI's emphasis on employment and the encouragement of work. The Act significantly expanded the Earned Income Tax Credit. It now provides a maximum refundable credit of $500 for a family head with low earnings, and provides some reduction in taxes to all such families with incomes below $10,000. Because the credit is tied to earned income, it makes work, relative to transfer recipience, more attractive than before, and thus seeks to reduce the adverse impact of transfers on labor supply. This emphasis on work and income support through employment is also reflected in the expansion of public employment programs.

The other developments in the late 1970's are also particularly relevant, because they focus on earned income and the labor market determinants of the persistent high level of pretransfer poverty. In 1976, Congress adopted the New Jobs Tax Credit, which subsidized employment over and above a fixed base (102 percent of the previous year's employment level). Because of the structure of that subsidy (50 percent of the first $4200 of earnings), employers were given a substantial incentive to hire low-skilled workers and to substitute labor for capital. It is estimated that, in the two-year life of the program, employment in the construction and retailing industry increased by at least 150,000 above that which would have existed in the absence of the policy.[59] Many of these additional workers are likely to be in the low-skill, low-wage category.

The second development occurred in late 1978 when Congress passed the Targeted Jobs Tax Credit. This program provides subsidization of 50 percent of the first $6000 of wages of certain target groups of workers, including disabled workers, youths from disadvantaged families, disadvantaged Vietnam-era veterans, ex-convicts, and recipients of SSI and General Relief.[60]

Both of these developments—as well as CETA, the jobs component of PBJI, and the expanded EITC—have perhaps signaled a new era in public policy that recognizes the connections among poverty, transfers and the labor market. All but the EITC aim at directly altering

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[59] John Bishop and Robert Haveman, "Employment Subsidies: Can Okun's Law be Repealed,' American Economic Review, May 1979.

[60] This subsidy is for the first year of employment. In the second year, the subsidy falls to 25 percent of the first $3000 of wages.

the demand for labor—especially the demand for workers with low productivity. All help to offset the likely adverse effects of minimum wage legislation, the work disincentives of transfer benefits, and other labor market rigidities on the earnings and unemployment of these workers. Thus, they address squarely the issues of pretransfer poverty and earnings inequality. The focus upon structural problems on the demand side of the low-skill labor market is a relatively new development, and would appear to have substantial potential for lowering both the inequality in the earnings distribution, and the high level of pretransfer poverty.

B. Some Speculation on Future Income Transfer Programs and Labor Market Policy

In recent years, there have been several important developments in both the economy and the income support system that may affect future policy. Because of the rapid growth in cash and in-kind transfer programs, income poverty as conventionally defined is no longer as serious a problem as it was in the early 1960's. With a concept of family income altered to include the recipient value of in-kind transfers and corrected for income underreporting and interfamily transfers the incidence of income poverty has been markedly reduced since 1965. The aggregate progress however, masks the high levels of poverty that persist for minorities and for females without spouses who head families. Also, there will probably continue to be a drift toward a greater proportion of households in poverty-prone groups—those with young, old, or female heads.

Although there has been substantial progress against absolute poverty and rapid growth in income-conditioned transfer and social welfare expenditures in the 1965–1978 period, pretransfer poverty has not declined, and the distribution of money income has not become notably less unequal. Indeed, on balance, income support policies have served merely to offset the increasing inequality in the distribution of earned income. Because of the apparent secular tendency of the labor market, as it currently operates, to increase the spread between high- and low-earnings families, a large and perhaps growing social welfare budget appears necessary simply to prevent an increase in income inequality. This has been particularly true in the past five years, during which unemployment and inflation have remained at high levels and real family disposable incomes have stagnated.

Finally, labor market policy of the 1960's and early 1970's largely emphasized the supply side of the low-wage labor market—education and training policies were designed to improve the skills, productivity, and hence the earnings, of low-skilled workers. It has been well documented that this approach has not been particularly effective.[61] Although there is no easy explanation for the disappointing results from supply-side policies, the internal functioning of the labor market has become a primary suspect.

In light of these developments, what sorts of policies appear most effective for further reducing poverty and inequality? An expansion of the current income support system is not likely to increase its antipoverty impact appreciably. A simple statistical "experiment" shows

[61] Henry Levin, "A Decade of Policy Developments in Improving Education and Training for Low-Income Populations," in Haveman, "Decade of Federal Antipoverty Policy," (New York: Academic Press, 1977).

why. Suppose that every transfer recipient could have received an extra 10 percent in cash and in-kind aid in 1974. Further, assume that this extra income would not have produced any reduction in work effort or decline in earnings, so that the total income of recipients would have risen by the full amount of the transfer increase. In such a scenario, transfer spending would have risen $12.1 billion; the poverty population (under the adjusted measure) would have fallen from 16.4 to 15.0 million; and, the poverty gap would have registered $8.7 billion instead of $9.3 billion. Of the added $12 billion, merely $0.6 billion, or 5 percent, would actually have helped cut the poverty gap. Such a meager decline in economic need for such great direct cost is clear evidence that simply expanding the existing transfer system without major reform of eligibility and benefit schedules will yield small returns. Moreover, the increased benefits as well as the higher taxes to finance them may create additional indirect costs in the form of labor supply and savings effects.

Programs oriented toward increasing "human capital" are no longer expected to play a central role in antipoverty policy. The EITC, which tends to stimulate work effort but does not shift the demand for labor, is a more passive supply-side program that reduce poverty. It is one of the few supply-side activities which Congress should consider expanding.

There are two other principal approaches—pursuing active labor demand policies and major restructuring of the transfer system. Labor market initiatives appear relatively more attractive for at least three reasons. First, they can reduce poverty and inequality while tending to maintain or enhance work effort and productivity. Careful reform of transfer programs might also increase work incentives while meeting distributional goals, but the equity-efficiency trade-off is likely to be less difficult for labor market policies. Second, helping others to increase their earnings accords with both traditional and current American social values. The Nation appears to prefer offering the needy a "hand-up" rather than a "hand-out." The jobs-oriented policies described above as well as the Nation's earlier commitment to training and education efforts testify to the political viability of this approach. Third, Congress in recent years has rejected wholesale welfare reform and even modest reforms to Social Security. Demand-side policies, on the other hand, have been neither seriously attempted nor comprehensively analyzed. Because the deficiencies of human capital programs and the tangled trade-offs of welfare reform have been thoroughly exposed, demand-side approaches, whose pitfalls are less well-known, may seem better in comparison. Thus, demand-side policies that stimulate employment in the private and public sectors and focus on the structure of the labor market and the concept of the "job," may well seem the most appropriate mechanisms to achieve reductions in poverty and inequality.

The structural characteristics of existing labor markets that may need to be altered include labor union power and exclusionary practices, minimum wage legislation, restrictions on entry to certain occupations, impediments to spatial and occupational mobility, racial discrimination, and the operation of "internal" labor markets. These features are increasingly seen as contributors to high unemployment among youths and minorities, high pretransfer poverty, and substantial earnings and income inequality. Examples of changes in

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labor market policies that can alter these structural characteristics range from full worker participtation in firms' decisionmaking to more modest suggestions for tougher enforcement of anti-discrimination laws, increased on-the-job training, constraints on firm layoff and firing decisions, and greater internal seniority-based advancement up specified job ladders.

To the extent that political reasons preclude such fundamental changes, policies designed to supplement the results of the labor market, including employment subsidies, wage rate subsidies, and earnings supplements, appear increasingly attractive. The New Jobs Tax Credit and Targeted Jobs Tax Credit could well be the first steps in a more concerted effort to stimulate private sector demand for low productivity workers, to reduce their high unemployment rates, and to increase their earned incomes. Such employment subsidies can offset the labor market distortions created by minimum wages and racial discrimination, and if appropriately designed they can lead to reductions in unemployment with minimal inflationary effects.[62] In concert with these policies, the ultimate supplement to the labor market—guaranteed public service employment—could also be continued and expanded. In a time of fiscal caution and increasing reservations about government intervention, however, the high, visible costs and problematic outputs of this sort of program, as well as current dissatisfaction with CETA operations, make it less attractive than the indirect, less noticeable credits and subsidies.[63]

There are serious administrative, equity and incentive problems inherent in both employment subsidies and public employment strategies. Nevertheless, if combined with: (1) an earnings supplement for those employed by the private sector; (2) expanded support for child care to help single parents enter and stay in the work force; and (3) an income guarantee for those not expected to work, a strategy emphasizing employment subsidization for private sector work or direct public employment could lead to increased employment of low-productivity workers, a reduction in earnings, inequality, and a decrease in pretransfer poverty.

Policies oriented toward improving the earnings of low-income families will have to deal with the constraints imposed by the welfare system, however. Indeed, the complexity of the interactions between labor market behavior and welfare programs is one of the major research lessons of the past decade. For current income support policies to help achieve reductions in pretransfer poverty and earnings inequality, they must reduce labor supply disincentives and curtail the horizontal inequities among low-income families. Fundamental welfare reform should correct these problems in a truly satisfactory manner. Thus, active labor market policies and restructuring of the welfare system are complementary, not competing strategies.[64]

The welfare overhaul strategy, however, is clearly nonmarginal in approach and impact. As past experience shows, it is likely to encounter substantial political opposition for this reason. The reduction in bene-

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[62] Robert Haveman and Gregory Christainsen, "Public Employment and Wage Subsidies in Western Europe and the U.S.: What We're Doing and What We Know," in National Commission for Manpower Policy, "European Labor Market Policies," Special Report 27, September, 1978.

[63] For a full discussion of the potentials and problems of public employment and wage subsidy policies, see John Palmer (ed.), "Creating Jobs: Public Employment and Wage Subsidies" (Washington: The Brookings Institution, 1978).

[64] For a discussion emphasizing this complementary, see Sheldon Danziger, Irwin Garfinkel, and Robert Haveman, "Poverty, Welfare, and Earnings: A New Approach," Challenge, September/October 1979, in press.

fits to some of the beneficiaries of current programs and the probable increase in taxes for higher-income families—the inevitable results of such reforms—would be primary sources of such opposition.

Instead of taking a comprehensive approach, some view the existing potpourri of cash and in-kind transfer programs as an acceptable start toward a more effective income redistribution system. The strategy implied by their approach is one of extending the coverage and benefits on state-controlled programs, adding programs—such as comprehensive national health insurance, child care subsidies, and rent supplements—to fill in the gaps in coverage, and simultaneously pursuing jobs policies.

In following an incremental strategy, two difficulties will have to be confronted. First, enacting new income-conditioned programs and improving older ones would probably add to the already serious problem of work disincentives. This would act at cross purposes with the policies designed to stimulate employment. Careful coordination between transfers, tax policy, and jobs programs would seem essential. Second, it should also be recognized that the strategy of extending a set of categorical programs is likely to exacerbate the administrative inefficiencies and overlaps in these programs and to encourage the discretionary behavior of program administrators.

As attention turns toward employment policies, several factors are likely to affect adversely the growth rate of conventional cash and in-kind transfer spending: (1) a shift in political focus to non-income maintenance issues; (2) general budgetary pressures; (3) concern with the financial soundness of Social Security (and the recent increase in the payroll tax required to finance it); and (4) a growing sensitivity to the possible adverse effects on output and employment which may accompany expanded income support programs. Nonetheless, there is ample scope for incremental changes and growth in income support programs. Some form of national health insurance, perhaps starting with a program for children, looms on the horizon and would be a logical extension and reform of Medicare and Medicaid. Reform of the Social Security benefit structure to reduce the inequities between one- and two-earner families in gathering support and may lead to higher outlays. Child care subsidies, a natural complement to jobs programs, can be expanded. And increased participation in SSI, Food Stamps, and subsidized housing programs could swell spending on these transfers. While major welfare reform has failed twice in the 1970's, there is every reason to expect continued marginal changes in income support policies in the 1980's. The mandating by the Federal Government of national minimum benefit level in the AFDC program and of the establishment of an AFDC–U program in all states are logical next steps. In somewhat disguised form, President Carter's May 1979 proposed reform package included these steps.

Obviously, what will in fact occur cannot be accurately anticipated. As in the previous decade, many future policy developments affecting earnings and income inequality are likely to be both unplanned and unanticipated. If one were inclined to speculate, however, it would not be unreasonable to forecast that, within a decade, analysts will record a modest reduction in earnings and income inequality and attribute it to some combination of: (1) a better-coordinated (if not overhauled) and somewhat larger cash and in-kind transfer

system; (2) a significantly expanded employment subsidy and public employment policy; and (3) a modest restructuring of labor markets, including a reduction in labor market discrimination by race and sex. Only the commitment of American citizens and their leaders will determine whether even such a mildly optimistic forecast is warranted.

TRENDS IN SOCIAL WELFARE SPENDING: FACTORS THAT WILL SHAPE THE FUTURE

By Robert Harris*

CONTENTS

I. INTRODUCTION

Future trends in social welfare spending—and programs—will be affected by social, economic, and political factors, as they have been in the past. Since some of those underlying factors are changing, future trends in expenditures on human service programs will be quite different than in recent decades. Expectations for future growth in spending must be quite pessimistic for many program areas. This outlook stems from the following two observations:

Many of the underlying social and economic forces that determine the future have hit turning points in recent years. Thus it is unlikely that the future will reflect past trends nearly as much as has been assumed in the recent past. Existing studies do not provide a sufficient basis for comfortably assessing the future. Much of the research needed to project emerging new trends into the future is just beginning and is not sufficient for reaching firm conclusions except in a few specific cases; and

* Executive vice president, The Urban Institute. An earlier version of this paper was commissioned by the National Conference on Social Welfare and presented at the 106th Annual Forum in Philadelphia, Pennsylvania, May 14, 1979. A number of Urban Institute colleagues contributed ideas and suggestions during the course of this work: I wish to thank Nancy Barrett, D. Lee Bawden, Burton Dunlop, Jack Goodman, Gary Hendricks, Sandra Hofferth, Jeffrey Koshel, Malcolm Baber, James Storey, Richard Wertheimer, and Sheila Zedlewski for their assistance. Alair A. Townsend of the U.S. Department of Health and Human Services provided valuable comments. None of them should be held responsible for any errors or for the conclusions reached. Views expressed are the author's and should not be attributed to the trustees of The Urban Institute or any of its sponsors.

Ultimately, political events will determine the future course of social welfare policies since the programs are largely publicly funded. Legislation is needed to authorize new programs, to modify or continue old ones, and to appropriate operating funds. The political climate of the recent past has facilitated rapid growth in social welfare spending, but this may change in the future. Thus, we may be at a political turning point.

In following sections of this paper, several topics that are important to thinking about the future will be discussed in a qualitative as well as a quantitative manner. Past social and economic trends will be reviewed, and reasons for future changes of uncertain magnitude will be discussed in detail.

Part 2 presents a case of social policy legislation based on projections gone wrong. The adoption of liberalizing amendments to the Social Security Act in 1972, based upon long-run projections that proved very wrong, has created serious long-run social and political problems.

Part 3 reviews past trends in expenditures for social welfare programs—and the political environment which facilitated the rapid growth of the last 15 years.

Part 4 explores two of the key changing factors that will affect the future: Population trends and the health of the economy. It also briefly notes the relationship between domestic social policy and international events.

Part 5 attempts to pull these diverse strands together, reviews the Federal budgetary outlook for the next several years, and presents some speculations about possible longer term future developments.

II. Social Security Financing: Unanticipated Problems

Future projections can go very wrong because underlying factors change in unanticipated ways. The history of social security legislation in the 1970s provides a dramatic example of problems that can be caused when major policy changes are based on uncertain long-term projections. The current financing problems of the social security system will seriously affect our ability to support all other social programs in the years ahead.

Since its enactment in 1935, the social security system has been steadily liberalized and expanded. It started as a modest program to provide income support to retired workers. Survivors benefits for families of deceased workers were added in 1939. Over the years successive amendments enacted by Congress steadily increased cash benefits. In 1956 a program was added to provide cash benefits to disabled workers and their families. Health benefit coverage for the aged was added in 1965 and extended to the disabled in 1972. Cash benefits are financed by a payroll tax on the earnings of current workers. Health benefits are financed by a combination of payroll taxes, beneficiary contributions, and Federal general revenues. The combined outlays for old age, survivors, disability insurance and medicare were $132 billion in fiscal year 1979—approximately 27 percent of total Federal outlays.[1]

[1] The legislative history of this program is summarized in U.S. Congress, "Handbook of Public Income Transfer Programs," Studies in Public Welfare, Paper No. 20, Subcommittee on Fiscal Pclicy, Joint Economic Committee, 1974. Outlay data from "The Budget of the United States Government, 1981" (Washington, D.C.: U.S. Government Printing Office, 1980).

Each benefit liberalization and program expansion was adopted by Congress only after presentation and careful review of detailed long-range projections of both benefit outlays and payroll tax revenues. The payroll tax rate and the taxable wage base have each been periodically adjusted to maintain an actuarial balance, so that projected revenues for a long period ahead—75 years—would be sufficient to cover projected outlays.

Congress has been willing to periodicaly increase taxes to finance liberalization of benefits under this very popular system. The last significant liberalization of current benefits was enacted in 1972. Numerous changes were made, including an across-the-board 20 percent increase in cash benefits and the explicit linking of benefits to the consumer price index—so that in the future they would automatically increase as prices rose. These changes were financed in the usual manner (an increase in payroll taxes) coupled with a provision that would automatically raise benefits and taxes annually as the consumer price index rose. Based on careful actuarial studies, it was expected that projected increases in revenues would cover the projected increases in benefit outlays.[2]

This popular legislative package met the real needs of many citizens at a cost in higher taxes that seemed quite reasonable and politically acceptable at the time, based on the projections that were made. But something went very wrong. In 1974 a new actuarial study was conducted. Some of the key underlying assumptions used in earlier analyses were changed. The new assumptions projected reduced future birth rates, lower rates of real economic growth, and more rapid inflations.[3] These changes increased the projected future costs of the system's benefits and lowered projected future revenues. Analysts discovered that the system was seriously in deficit: long-run revenues would fall considerable short of long-run costs. In addition, costs of disability claims were beginning to rise more rapidly than had been expected, leading to an expected short-run deficit in the system's finances as well. Newspaper stories and magazine articles began announcing and still continue to announce the impending bankruptcy of the system.

In 1976, another actuarial study was made, with further revisions in assumptions. Three sets of assumptions were presented, ranging from optimistic to pessimistic. This study showed an even larger deficit, except under the most optimistic—and unrealistic—projection. The average payroll tax set for the next 75 years in the 1972 legislation to finance cash benefits was 10.9 percent shared by employers and employees. The 1976 intermediate projection indicated that the tax rate should be set at 18.9 percent simply to support the existing benefit structure. Stunned policymakers and their advisors immediately began seeking solutions to the problem. None of the proposed solutions were appealing, since all involved either significantly increasing taxes or reducing benefits, or some combination of both. Public debate was bitter and often acrimonious. An interim resolution was reached in 1977, with enactment of legislation modestly reducing some benefits

[2] The full package of changes is described in U.S. Congress, "Social Security Amendments of 1972," Report of the Committee on Finance to Accompany H.R. 1 Senate Report 92-1230, September 26, 1972. A summary is provided in "H.R. 1: Social Security Increases; No Welfare Reform," Congressional Quarterly, Vol. 30, No. 43, October 21, 1972.

[3] The sensitivity of the financial balance of the system to these three factors is explored in Alexander Korns, "The Future of Social Security." The actuarial studies and assumptions used are discussed in F. J. Crowley, "Financing the Social Security Program—Then and Now." Both papers appear in U.S. Congress, "Issues in Financing Retirement Income," studies in Public Welfare, Paper No. 18, Subcommittee on Fiscal Policy, Joint Economic Committee, 1974.

and greatly increasing revenues by increasing both the tax rate and the taxable wage base.[4] It was the largest peacetime tax increase enacted by Congress in our Nation's history, and it was not attractive to politicians then or taxpayers since, no matter how badly it was needed.[5]

In 1977, during floor debate over the need for a tax increase, Senator Russell Long (Finance Committee chairman) responded to a suggestion that the 1972 enactment of the increase in benefits was hasty as follows:[6]

> The action we took in 1972 was not hasty action. It was thoroughly considered. But the action was ill-advised. Frankly, nobody could have done any better at the time.
>
> At that time, the Advisory Committee on Social Security said we could afford a 20 percent increase and an automatic cost-of-living provision. They were advising us that we could afford what that amendment provided . . . I supported it, as did almost every other Senator here, because the Commissioner of Social Security and all those who always had been able to give us very solid and reliable predictions and cost estimates said this was something we could afford. I hate to say it, but the best experts in America proved to be in error. That is how we got into this situation.
>
> . . . there was a lot of respectable advice—in fact, I would say the overwhelming burden of respectable advice—headed by Mr. Robert Ball, the Commissioner of Social Security, and others, to the effect that we could afford it. They said we should adopt these so-called dynamic assumptions. Those dynamic assumptions proved to be too dynamic—more dynamic than we could afford. So we found ourselves in the situation we are in today.

From 1935 until 1972, the social security system's actuarial studies and long-run projections were based upon an arbitrary assumption that there would be no future growth in real earnings. This made long-run revenue projections extremely conservative and almost guaranteed that the system would be found to have a surplus whenever later actuarial studies were conducted. In 1972, for the first time, the long-run projections were based on "dynamic assumptions," including projected future growth in real earnings. Conceptually more realistic, the dynamic assumptions also made revenue projections much more sensitive to underlying and uncertain future trends in the economy and removed a large margin of safety that had heretofore been included in the projected balance of revenues and outlays.

The point is that unless assumptions about underlying or causal factors are very soundly based and explicitly qualified, they must be used with great caution for long-run projections that underlie major policy decisions. Seemingly technical assumptions about future rates of economic growth and population change are important in the necessary planning for some programs based on long time horizons. But economic change and population growth are quite difficult to predict for long periods into the future, and miscalculation can easily result.

The problems caused by this miscalculation for the future of general social welfare policy are profound. The size of the program and future outlay growth dictated by the existing legislation is likely to absorb

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[4] Unfortunately, increasing the taxable wage base now leads to considerably higher benefit entitlements in the long-run future. Thus, the solution can be viewed as simply deferring the problem.

[5] Background data on these events are presented in U.S. Congress, Congressional Budget Office, "Financing Social Security: Issues For the Short and the Long Term," July 1977. A political analysis can be found in Martha Derthick, "No Easy Votes on Social Security," The Public Interest, winter 1979. It should be noted that, even with the infusion of new financing enacted in 1977, the system is still in deficit, and proposals for selective benefit cuts are being discussed. At the same time, proposals abound for rolling back the unpopular payroll tax increase, and finding other means of financing the deficit.

[6] Congressional Record, Nov. 3, 1977, p. S-18618.

most Federal revenue growth that would otherwise be available for social welfare purposes. At the same time, there are potential demands for other new types of expenditures. The implications of these two simple facts will be explored at length in the remaining sections of this paper.

III. Where We Have Been

Society's commitment to collective action to meet human needs has increased greatly in recent years. Programs and policies to provide direct income support and government services to individuals and families have been expanded, and new programs have been adopted. Providing income support and services does mean spending money, however painful that may be, and most of the money is made available through the political process—governments funded more than 70 percent of total social welfare spending in 1978. This part reviews the economic and political trends that have shaped the recent past, and outlines the changes now taking place.

Social Welfare Spending

The Social Security Administration compiles useful data for the analysis of spending trends, providing some detail on social welfare spending over a long time period. The data series provides a rather comprehensive measure of spending to meet basic human needs—including income support programs such as Social Security, Public Assistance, and Food Stamps, expenditures for health, education, and the full range of social services.[7] Data are provided for both public and private programs, although less detail is available for the private programs.

Chart 1 shows growth in total public spending for social welfare programs by all levels of government from 1950 to 1978, compared with growth in gross national product (GNP).[8] During this period, public social welfare expenditures (SWE) grew more rapidly than GNP, and growth relative to GNP accelerated noticeably after 1965. Because of its faster growth rate, public SWE grew from 8.9 percent of GNP in 1950 to 11.7 percent by 1965, and to about 19.3 percent by 1978.

Growth in public SWE decelerated after 1976. This decline shows up more dramatically in chart 2, which shows expenditures as a percentage of GNP since 1950. Three curves are shown: Private programs, public programs, and the total of both private and public programs. This chart shows steady growth in the commitment of total national production to public social welfare spending throughout the period since 1955, at a moderate rate between 1955 and 1965, rapidly from 1965 to 1976, but turning down in 1977 and 1978. Private expenditures for social welfare purposes have grown fairly steadily over the entire period, but moderately relative to GNP.

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[7] The data on social welfare spending discussed in this section are all drawn from Social Security Administration sources. See Alfred Skolnik and Sophie Dales, "Social Welfare Expenditures: 1950-1975," Social Security Bulletin, January 1976, and Alma W. McMillan and Ann Kallman Bixby, "Social Welfare Expenditures, Fiscal Year 1978," Social Security Bulletin, May 1980.

[8] Gross national product is a comprehensive measure of the economy's production—measuring the total market value of all goods and services produced in a given year. The chart is on a special scale designed to highlight percentage rates of growth rather than levels. If the lines are parallel, the two series are growing at the same percentage rate. A steeper line indicates a higher percentage growth rate. Points are plotted at five-year intervals through 1975. Annual data are plotted for later years.

The Composition of Social Welfare Expenditures

Table 1 shows both public and private social welfare expenditures data broken into broad functional categories and GNP for 1950, 1965, 1975, and 1978. Average annual rates of growth for each item are shown in table 2 for the full period, and the three subperiods for which overall trends as shown in chart 1 seem different: 1950–1965, 1965–1975, and 1975–1978.

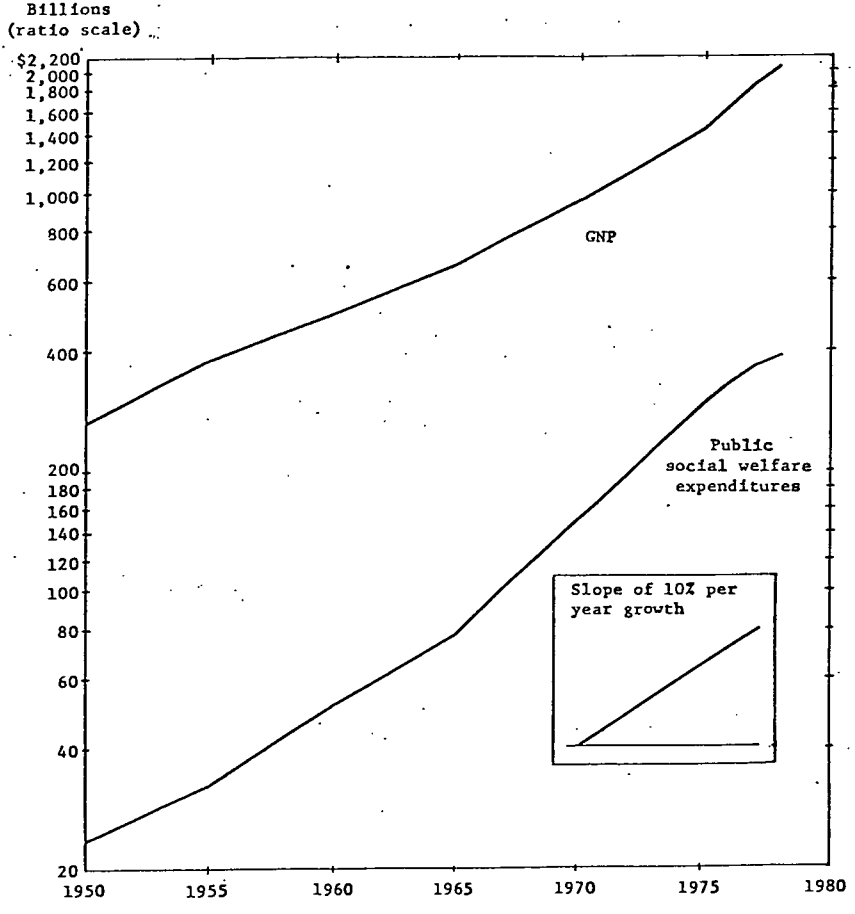

CHART 1.—Public spending for social welfare programs and gross national product, fiscal years 1950–78.

CHART 2.—Social welfare expenditures as percentage of GNP, fiscal years 1950–78.

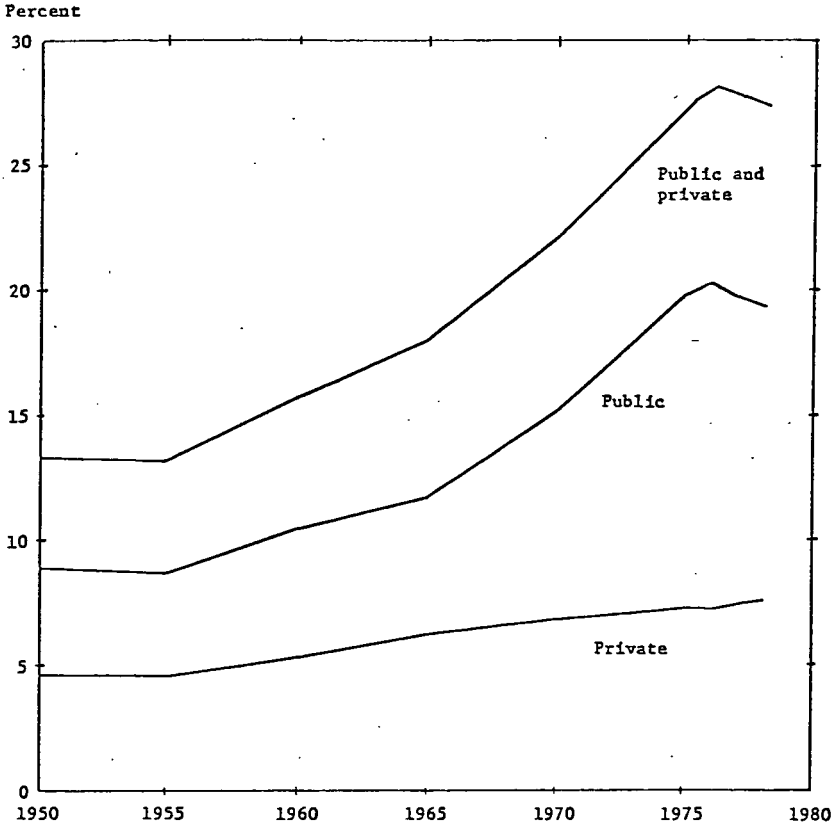

TABLE 1.—PUBLIC AND PRIVATE EXPENDITURES FOR SOCIAL WELFARE PURPOSES AND GROSS NATIONAL PRODUCT, FISCAL YEARS 1950, 1965, 1975, AND 1978

[Dollar amounts in billions]

Category of expenditures	1950	1965	1975	1978 [1]
Total, net [2]	$35.4	$117.8	$393.5	$548.9
Public	23.5	77.2	290.1	394.5
Private	12.2	42.7	111.7	166.0
Income maintenance	10.7	42.6	157.7	214.8
Public [3]	9.8	36.6	136.1	183.4
Private	1.0	6.0	21.6	31.4
Health	12.0	38.9	123.6	187.0
Public	3.1	9.5	51.2	76.2
Private	9.0	29.4	72.3	110.8
Education	11.0	34.1	100.0	124.1
Public	9.4	28.1	85.3	104.6
Private	1.6	6.0	14.7	19.5
Welfare and other services	2.0	4.3	20.5	34.6
Public	1.3	2.9	17.5	30.3
Private	.7	1.4	3.0	4.3
Gross national product	265	658	1,452	2,043
SWE as percent of GNP:				
Total, net [2]	13.4	17.9	27.1	26.9
Public	8.9	11.7	19.9	19.3
Private	4.6	6.5	7.7	8.1

[1] Preliminary data.
[2] Total expenditures are adjusted to eliminate duplication resulting from use of cash payments received under public and private programs to purchase medical and educational services. Separate data for public and private expenditures are not so adjusted.
[3] Source data include expenditures for food stamps with "welfare and other services." They are reclassified to "income maintenance" in this table.

Source: Data from Alma W. McMillan and Ann Kallman Bixby, "Social Welfare Expenditures, Fiscal Year 1978", Social Security Bulletin, May 1980.

Growth rates in the two earlier periods show some consistent patterns.

During the period 1950–1065, total SWE grew by an annual rate of 8.3 percent per year while GNP grew by 6.3 percent per year. Thus, for each percentage point growth in GNP, SWE grew by 1.3 percent. During the period 1965–1975, SWE spending grew by 12.8 percent per year while GNP grew 8.2 percent per year, or by 1.6 percent for each point of GNP, growth, clearly showing a sharp acceleration.

Growth rates vary among functional categories, but for each, the second period shows an increase in the growth rate relative to the prior period.

Growth patterns across the different functions, and in public versus private funds, also show a remarkable consistency. In the first subperiod, both public and private spending grew faster than GNP in every functional area but one (welfare and other services). In the second subperiod, each category but one (private welfare and other services) grew faster than GNP—and that one exception about matched GNP growth.

During these two periods our society, through both public and private decisions, made strong and broad commitments to expand social welfare programs—devoting an ever-increasing share of the Nation's resources to meeting human needs—either providing direct services or income support payments to particular population groups.

The period from 1975 to 1978 shows a slowdown in this commitment—with a marked slackening of growth in total SWE relative to GNP. The decline is largely attributable to slower growth in income maintenance spending. Growth in most functions remains significant however, although several items show less growth than in the prior period.

These data and this brief overview of past trends will be referred to in later sections of the paper, after a review of some of the political and economic factors which permitted the rapid expenditure growth which seems to be ending.

TABLE 2.—AVERAGE ANNUAL RATE OF GROWTH IN EXPENDITURES FOR SOCIAL WELFARE PURPOSES AND GROSS NATIONAL PRODUCT BETWEEN SELECTED FISCAL YEARS[2]

[In percent]

Category of expenditures	Time period			
	1950 to 1965	1965 to 1975	1975 to 1978[1]	1950 to 1978[1]
Total, net[2]	8.3	12.8	11.7	10.3
Public	8.2	14.2	10.8	10.6
Private	8.7	10.1	14.1	9.8
Income maintenance	9.6	14.0	10.8	11.3
Public[3]	9.2	14.0	10.5	11.0
Private	12.9	13.7	13.2	13.2
Health	8.1	12.3	14.8	10.3
Public	7.9	18.3	14.1	12.2
Private	8.2	9.4	15.3	9.4
Education	7.9	11.3	7.5	9.0
Public	7.6	11.7	7.0	9.0
Private	9.1	9.4	9.9	9.3
Welfare and other services	5.1	17.0	19.1	10.7
Public[3]	5.3	19.8	20.1	11.8
Private	4.8	8.1	12.7	6.8
Gross national product	6.3	8.2	12.1	7.6

[1] Data for 1978 preliminary.
[2] Total expenditures are adjusted to eliminate duplication resulting from use of cash payments received under public and private programs to purchase medical and educational services. Separate data for public and private expenditures are not so adjusted.
[3] Source data include expenditures for food stamps with "welfare and other services." They are reclassified to "income maintenance" in this table.

Source: Derived from data in Alma W. McMillan and Ann Kallman Bixby, "Social Welfare Expenditures, Fiscal Year 1978," Social Security Bulletin, May 1980.

Political and Economic Background

The development of coherent national policy to assure that adequate levels of income and well-being are available to all has developed slowly in the United States compared to other industrial nations. The adoption of national policies to improve the well-being of individuals—through income support and the public funding and provision of human services—had been sporadic until the 1960s. Most major social welfare programs were adopted in the 1930s, but their development was interrupted by World War II. Little of major import for domestic social policy was accomplished in the immediate postwar period and during the two terms of a nonactivist President, although many potential programs were discussed and proposed by members of both political parties. The election of President Kennedy in 1960 reawakened interest in many domestic issues and laid the groundwork for growth in social welfare programs which accelerated in the mid-1960s. Corresponding changes were taking place in Congress. Power was shifting toward legislators who were more anxious to adopt social legislation and away from those concerned with stopping it.[9]

Finally, society's commitments to expand social welfare programs were growing stronger through both public and private decisions. People were being provided with direct services and with money with which they could meet their own needs. The political climate favored

[9] These political developments are discussed in detail in James L. Sundquist, "Politics and Policy: The Eisenhower, Kennedy, and Johnson Years" (Washington, D.C.: The Brookings Institution, 1968).

expanding the role of governments at all levels in supporting social welfare programs.

How did this happen? One important factor is that plenty of money was available for spending. Obviously, such a phenomenon affected the political climate and the willingness of political leaders to make financial commitments.

THE FISCAL DIVIDEND AND PUBLIC POLICY

In the early 1960s a major concern of Federal Government policy makers was an embarrassment of revenues. The economy had entered a period of rapid growth, and the Federal Government's revenues from the existing tax system automatically grew faster than its spending on existing programs. That was a remarkable state of affairs which was expected to continue. Economists thought that they had learned to manage the economy, and maintain full employment, steady growth in income, and price stability. Under those conditions, Federal revenues were expected to grow by $7 to $8 billion per year (in 1960 dollars) net of some automatic increases in spending. And remarkably, if these funds were left unspent, they would place a "fiscal drag" on the economy, retarding future economic growth. It was viewed as necessary to dispose of these increases through declaration of "fiscal dividends," either in the form of tax cuts or increasing Federal spending.[10]

Accordingly, during that period taxes were cut to dispose of part of the revenue surplus, and more money was spent on all sorts of government programs. It was a grand time to be engaged in the process of formulating public policy. During the 1960s and early 1970s, there were periodic tax cuts and increased social spending. Almost every conceivable idea for good ways for government to spend money received some consideration. Many were enacted into law and many were not.

With stable prices, declining unemployment, steadily growing national output, and automatically growing government revenues, more resources could be devoted to social programs with no apparent cost. Building on many ideas developed earlier, the 1960s were years of planning, plotting legislative strategy, drafting major new pieces of legislation, and enacting them. Momentum developed quickly and work went forward at full speed during the Kennedy, Johnson, and first Nixon administrations, without the apparent need to worry about any possible inability to sustain programs over the long run. In all three administrations Federal Government commitments were made to increase spending on social welfare programs.

PROLIFERATION AND EXPANSION OF PROGRAMS

The rapid growth of public spending for these purposes developed from two sources. Programs originally adopted during the New Deal continued to be liberalized and to mature, a process which had gone on during the 1950s as well. In addition, new programs were proposed at a rapid rate throughout the 1960s, continuing during the early 1970s. Many were enacted and many were adopted for just about every

[10] These views are clearly expounded by the then Chairman of the President's Council of Economic Advisers. See Walter F. Heller, "New Dimensions of Political Economy" (Cambridge, Mass.: Harvard University Press, 1966), p. 65 and *passim*.

identifiable group in need of income or some human service. A partial list of important legislative items follows, including a few near misses.[11]

The Area Redevelopment Act of 1961 and the Manpower Development and Training Act of 1962 were designed to create employment opportunities for individuals without work.

The basic Aid to Families with Dependent Children (AFDC) program was amended to permit payments to families with an unemployed father present in 1961. This was a first departure from the principle of not providing federal welfare assistance to unemployed employables.

A general war on poverty was declared in 1964 and new programs were adopted under its auspicies in the ensuing years, including both service programs and further liberalization of income support programs.

The Elementary and Secondary Education Act of 1965 was enacted to improve educational opportunities of disadvantaged children, for the first time providing significant amounts of Federal aid to elementary and secondary schools.

The Social Security Amendments of 1962 and 1965 created broad, federally funded social services programs for welfare recipients and medical care programs for both welfare recipients and retirees under Social Security (Medicaid and Medicare).

A Food Stamp program, initiated as a pilot project by executive order in 1961, was enacted into law in 1964. This program was originally available at local option and remained small until federal benefit and eligibility standards were imposed in 1971 and all counties were required to adopt it in 1974.

A federalized welfare system was seriously considered during the late 1960s and advanced as a major legislative initiative by President Nixon in 1970. The Senate considered and rejected the Family Assistance Plan in 1972, after prolonged debate and passage by the House twice. This program would have provided cash income supplements to all low-income families with children. The Supplemental Security Income plan was enacted, however, in effect federalizing Old Age Assistance, Aid to the Blind, and Aid to the Permanently and Totally Disabled. In addition an Earned Income Tax Credit was enacted, providing modest income supplements to working poor families.

A comprehensive child development program, which would have provided funding of $2 billion per year for services, was passed by Congress in 1971 but vetoed by President Nixon.

In 1972 and 1973 Congress passed legislation to broaden the range of rehabilitation services for the disabled, to provide for services to facilitate independent living as well as continue vocationally oriented services. This was also successfully vetoed by President Nixon, and Congress was satisfied to require a study, deferring action until a later date.

Major liberalizations were made in the Social Security system in 1972, as discussed in part II of this paper.

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[11] Some of these examples are discussed in more detail in Robert Harris, "Policy Analysis and Policy Development," Social Service Review, September 1973; and "Public Policy to Provide Income Security: The Recent Politics of Welfare Reform," The Urban Institute, Working Paper, 1977. The legislative history of child development programs is discussed in "OEO Child Care Program: Veto Sustained in Senate," Congressional Quarterly Almanac (Washington, D.C.: Congressional Quarterly, 1971), p. 504. The rehabilitation services debate is discussed in The Urban Institute, "Report of the Comprehensive Needs Study" (Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1975).

Private spending, while not growing as rapidly as public, also continued to grow, no doubt reflecting some of the same optimism about the future, although less is known about the specific private programs and how they evolved.[12]

The rate of proliferation of programs slowed in the later 1960s, in part because attention turned to war—with political actors engaged in either supporting the Vietnam conflict or trying to stop it. But spending did continue to rise for existing programs, and some new ones appeared in the 1970s—the Food Stamp program is a notable case. Voices of caution began to be heard more often and widely, however. Programs had grown rapidly, had been mounted quickly, and many observers feared that action had gone too far too fast. As early as 1968, James L. Sundquist, a sympathetic observer, had already noted as follows.[13]

> . . . there are many signs that the capacity of the United States government to make policies and establish programs in the domestic field has outrun its capacity, or its determination, to finance and administer them.

As we entered the 1970s, concerns about the continued growth in public spending for social welfare purposes intensified. Questions about the efficiency and effectiveness of many of the new programs began to crop up repeatedly, even among liberal supporters of the welfare state. A study which reviewed Federal agency experience in program evaluation sadly noted, "The most impressive finding about the evaluation of social programs in the federal government is that substantial work in this field has been almost nonexistent."[14] The dimensions of the 1972 social security fiasco began to unfold at the same time that our economic future began to look more cloudy. Some retrenchments had already been made, in bits and pieces, including putting a ceiling on social services spending under Title IV of the Social Security Act. With that change, enacted in 1972, an open-ended program that had been growing rapidly was closed, largely in response to concerns over its uncontrolled expansion.[15] Other cuts were proposed and some were adopted.

President Ford, who expressed concern in 1976 that transfer payments were taking an increasing share of the budget, called for a rethinking of the pattern of public policy. He cautioned that ". . . if these kinds of expenditures continue at anywhere near their past rate of growth . . . total government expenditures could slice away more than half of our GNP in two decades."[16] Other commentators used the same facts to paint an even bleaker picture.[17] The rethinking continues today, among both Democrats and Republicans.

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[12] Perhaps as important to social policy as the programs involving money was enactment of numerous pieces of civil rights legislation—in an attempt to rid our society of long-standing patterns of discrimination against racial and ethnic minorities. In addition to ensuring access to public programs and facilities to all, laws were adopted to regulate private behavior—outlawing discrimination in housing and the labor market. Attempts were made to end exclusion of the disadvantaged from political power through federally sponsored voting reforms at all levels of government. Some of the new programs for the poor required participation of community groups in program decision making—OEO's Community Action programs and the Model Cities program both required this. Such programs also helped politically mobilize disadvantaged groups, creating a larger political constituency for spending on social programs.

[13] James L. Sundquist, "Politics and Policy," p. 10.

[14] Joseph Wholey et al., "Federal Evaluation Policy" (Washington, D.C.: The Urban Institute, 1970).

[15] Martha Derthick, "Uncontrollable Spending for Social Service Grants" (Washington, D.C.: The Brookings Institution, 1975).

[16] "The President's Remarks at a News Briefing on the Budget for Fiscal Year 1976, February 1, 1975," Weekly Compilation of Presidential Documents, vol. 11:6, p. 126.

[17] A Wall Street Journal editorial, for example, warned of disaster for productivity in the economy because ". . . we are in the midst of an explosion in transfer payments." The "Transfer Payments Explosion," Wall Street Journal, January 24, 1975.

The Changing Outlook

The last few years have been humbling to those who were trained and seasoned as policy analysts during the late 1950s and 1960s. Then it was assumed that the Government could more or less control the business cycle, maintain reasonably low unemployment rates, and restrain inflation, and that analysts could make reasonably good economic and fiscal projections. Inflation throughout the 1950s and 1960s averaged about 2 percent per year. An unemployment rate in excess of 4 percent caused serious alarm, and by application of monetary and fiscal policy tools, including a sizable tax cut in 1964, macroeconomic policy makers kept unemployment comfortably below 4 percent from 1965 to 1969.[18] Planning of public and private policies and programs to provide human needs could take control over those factors as given. Analysts and political actors could define problems, develop possible solutions, see them enacted into law—at least in part—and expect appropriations to flow without causing budgetary strain. Since then, the policy-making environment has changed considerably.

Many of the financial problems faced today by cities, States, educational institutions, private agencies and citizens would have seemed unthinkable 10 years ago. They certainly bear no relationship to even the most pessimistic views then prevalent about the near future. Yet our political system is not putting forward public solutions—that is, new money. Many private institutions are in the same situation. The Ford Foundation, which had played a leading role in the social activism of the 1960s, cut its spending rate by half and has ended support of a number of its programs.[19] In the past few years it has become clear that unforseen factors may make it impossible to achieve all of the goals implicit in the legislation considered and enacted in the 1960s.

Major new legislative thrusts have not developed into action in recent years, as both the executive branch agencies and the Congress have looked harder at commitments already made, and into a murkier and apparently less cheerful future. President Carter's proposed 1980 budget was rather austere—and included proposed cuts or no growth in many social welfare programs. Congressional debate over the fiscal year 1980 budget made it clear that it will be politically difficult to keep all current programs at current levels. The House Budget Committee, dominated by liberals, included in its version of the congressional budget for 1980 a number of proposed reforms (cuts in outlays) for programs which would have been untouchable a few years ago—including Social Security, health, education, vocational rehabilitation, welfare, and veterans' programs.[20] The dialog between Congress and the President over the 1981 budget, currently under way, reflects greater pressures to hold the line on spending in general and to roll back social commitments in particular. Several things have happened which have changed the outlook.

New demographic analyses point to a very different future than we had anticipated in terms of the age characteristics of the population and the composition of the labor force. Past spend-

[18] Data on prices, income, productivity, and unemployment cited in this and later sections are all drawn from "Economic Report of the President, 1980" (Washington, D.C.: U.S. Government Printing Office, 1980), tables B-29, B-37, and B-52.

[19] "Current Interests of the Ford Foundation, 1976 and 1977," The Ford Foundation, 1975.

[20] U.S. Congress, House Committee on the Budget, First Concurrent Resolution on the Budget, Fiscal Year 1980, April 1979.

ing commitments are looming larger in the present and the long run future than was expected when they were made.

The economic outlook is bleak. Inflation seems out of control—and it seems clear that we do not know how to readily control it while maintaining high employment. During the 1970s the consumer price index has increased at a much higher rate than in earlier years, averaging more than 7 percent per year, with the lowest year showing a 3.4 percent increase and the highest (thus far) exceeding 11 percent. The unemployment rate, which was 3.5 percent in 1969, rose to 4.9 percent in 1970, and has not been lower since. It was 8.5 percent in 1975, and 6 to 7 percent rates have been common. Productivity growth has slowed, making projections of real economic growth for the future less certain and less optimistic.

Finally, the outlook for long term peace and stability in international relations seems slimmer than at any time in recent history, with clear implications for domestic social policy.

Perhaps in response to these changes, the public has apparently revolted against past trends. Choices must be made about the relative growth and decline of certain programs—and these choices are being made through the political process. Political leaders of both parties at all levels of government feel great pressure to cut taxes and hold the line on social welfare spending. It no longer seems possible to allow all human services programs to rise rapidly while income spent on private pursuits also rises. The outlook is for no more fiscal dividends.

The next section of the paper will systematically and briefly review these drastic changes of the past few years. Such changes have important but uncertain implications for the future of social welfare spending.

IV. Factors That Will Affect the Future

Projecting social welfare needs and governmental responses to them will involve assumptions about: (1) demographic changes; (2) underlying economic forces; and (3) the domestic impact of volatile international events. Uncertainty about these areas and how they will shape the future has increased in recent years. These three areas are discussed in detail in this section before turning in part V to the ultimate determinant of the future: The political climate.

Demographic Changes

The President's 1980 budget included a long discussion of the effects that population change will have on Federal budget priorities and national policy choices for the coming generation.[21] The budget is an unlikely place for a review of demographic trends, but the prominence of the setting attests to the increasing awareness by policy makers that population changes now taking place offer new challenges and opportunities for public policy. A House Select Committee on Population held extensive hearings in 1978 and reported on demographic trends in the United States and abroad and on the causes and conse-

[21] "The Budget of the United States Government, Fiscal Year 1980" (Washington, D.C., U.S. Government Printing Office, January 1979), p. 52.

quences of these trends, reflecting congressional awareness of the same phenomena.[22]

Interest in population trends in the 1960s was focused primarily on growth of the Nation's total population and its effects on the Nation's resources and standard of living: policy concern was primarily with slowing population growth. A President's Commission on Population Growth and the American Future was established, and in 1972 it issued a final report focused on causes and consequences of aggregate population growth, and public policies to deal with it.[23] As that commission was writing its final report, however, population trends were already shifting. Fertility has been dropping steadily: the total fertility rate reached approximately 1,800 per 1,000 women in 1975 and has not significantly varied since. This is the lowest level ever recorded. If continued, this fertility rate will lead to a declining population in the future.[24] As the decade of the 1980s opens, key population issues have more to do with the future age composition, family structure, and geographic distribution of the Nation's population than with the population's overall size.

Chart 3 shows the profound implications of different birth rate assumptions for changes in population. Series I assumes a long-term fertility rate of 2,700. Series II is based on a rate of 2,100, approximately equal to the zero population growth rate. Series III uses 1,700, which is slightly below the current actual rate. The differences are striking. Series II, which is most commonly used, shows modest and declining overall population growth in the future. It would ultimately lead to zero growth. Series III eventually leads to absolute decline in total population. The first "echo" shown reflects movement into childbearing ages of the children of the 1950s baby boom. The second echo is caused by birth of their grandchildren. Chart 4 shows how the age distribution of the population will change over the next 50 years, using the Series II projections. As you look further and further into the future, the age distribution gets flatter and flatter. These projected changes will affect many policies.

The baby boom generation, members of which are now in their teens and early twenties, was followed by a baby bust during the last 15 years. This has already had important ramifications for educational institutions—first leading to rapid expansion in elementary and secondary school enrollments, followed by decline. Institutions of higher education experienced a similar expansion and decline. The boom group and the following trough of younger age cohorts are now moving up in the age distribution. The Nation's housing and labor markets are suffering the effects—there are shortages of appropriate housing to meet the needs of newly forming households and pressures to find jobs for large numbers of new labor force entrants. These pressures will ease in several years—and we may face labor shortages at some later date.

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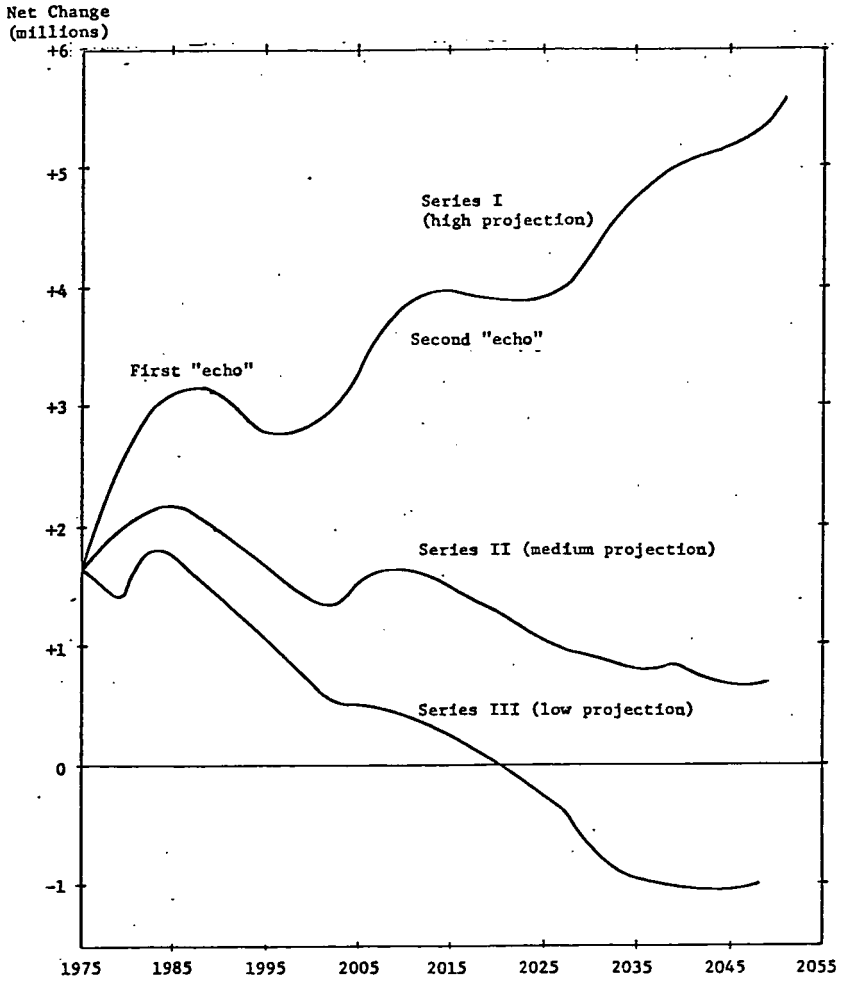
[22] U.S. Congress, House Select Committee on Population. "Domestic Consequences of United States Population Change," 1978, and "Final Report of the Select Committee on Population," 1978 (Washington, D.C.: U.S. Government Printing Office, 1978).

[23] "Population and the American Future," Report of the Commission on Population Growth and the American Future (New York: New American Library, 1972).

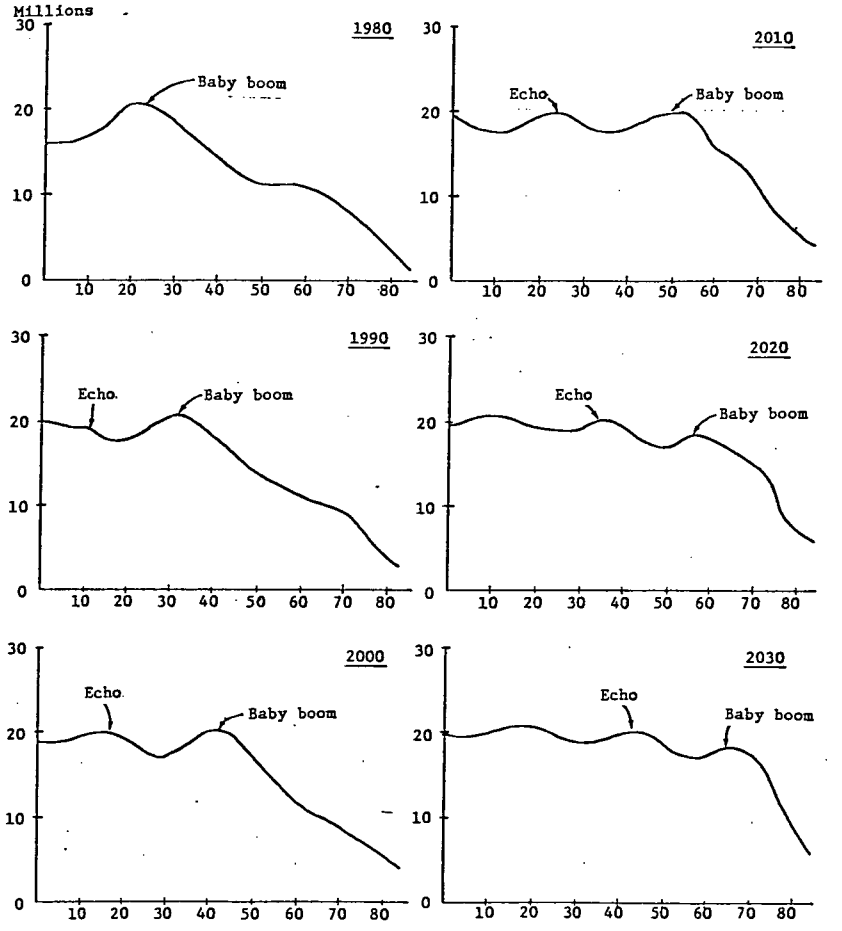
[24] That is, about 1,800 children will be born to each 1,000 women over their reproductive lives if current pattern continues. The fertility rate for zero population growth, given current mortality rates, is 2,110. Current fertility and mortality rates, if unchanged for a long period, would lead to population decline of .5 to .6 percent per year. These statements and the data presented ignore possible significant population growth through increases in immigration. Data from U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1979, table 82.

CHART 3.—Projected annual net population change, 1975–2050.



Source: Data from U.S. Department of Commerce, Bureau of the Census. Chart reproduced from U.S. Congress, "Domestic Consequences of U.S. Population Change," report prepared by the Select Committee on Population, U.S. House of Representatives, 1978.

CHART 4.—Future population size by 5-year groups, Census Bureau series II projection.



Source: Data from U.S. Department of Commerce, Bureau of the Census. Chart reproduced from U.S. Congress, "Domestic Consequences of U.S. Population Change," report prepared by the Select Committee on Population, U.S. House of Representatives, 1978.

In the far distant future, the baby boom generation will place large new burdens on the health care sector and all public and private pension systems. As noted earlier, current concerns over the apparent bankruptcy of the social security system primarily reflect recognition of the long-run implications of current low birth rates. That problem will become acute in the 21st century, when the baby boom generation reaches retirement age and must rely on a relatively smaller working population to support the system financially.

The recent awareness of the major changes now occurring in the U.S. population, and the importance of those changes for public policy, have not yet been matched by good information on how best to deal with them. For example, population movement out of some northern urban areas has contributed to housing deterioration in the cities.

What housing strategies should local governments adopt in response? Increased participation in the labor force by married women is creating a growing perceived need for child care. What role should the public sector play in meeting that need? There is no consensus yet on either question. We also know that today's low fertility rates, if continued, will lead to a much more rapidly aging population in the 21st century, which may call for many changes in policy. Again we are uncertain about what today's policy responses will be or should be.[25]

Clearly changes in the population's size, its age distribution, and other characteristics will have profound impact for the future of all human services—and social welfare spending. Demographic changes will determine the absolute numbers of individuals at different stages of life where they have need for different services and where their potential contributions to society differ. Demographic changes will also determine the relative sizes of different gruops, leading to different relative political support for various programs and services. Exactly how all of this will play out remains uncertain.[26] Two demographic phenomena do have clear policy impacts that can be discussed for illustrative purposes. Both have received a great deal of attention in the press and are subjects of current policy debate. One, labeled as "The Graying of America," deals with the impact of a steadily and rapidly aging population on society. A second phenomenon having current impact on a wide range of policy issues is the changing role of women in the labor force and society. This is bringing pressure to bear for changes, and some of these will be discussed briefly.

THE GRAYING OF AMERICA [27]

The percentage of the total population 65 and over, now at 10.7 percent, is projected to rise to 12.2 percent by the year 2000 and will rise further to 15.5 percent by 2020.[28] Much of the concern over this change has to do with the reduced number of workers per retiree that it implies, and the implications for supporting the costs of the social security system and other supportive programs. It is frequently noted that the ratio of social security contributors to beneficiaries, which was 5:1 only a few years ago, and which is now a little over 3:1, will decline steadily to nearly 2:1 during the next 50 years (see chart 5). Since the social security system is financed on a long-term basis, and changes take effect slowly, these trends must be faced now. With the new revenues provided by the tax increase of 1977, a short-term deficit was temporarily averted although new actuarial studies recently completed show it likely to emerge again.[29] Most serious problems will arise in financing retirement benefits early in the 21st century. Chart 6 shows graphically a 1978 projection of the revenues available to the system, as a percentage of taxable payroll,

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[25] In its final report, the House Select Committee on Population was properly cautious: It stressed uncertainty and a need for new research, as well as making some immediate programmatic recommendations.

[26] A number of possibilities are explored in Thomas J. Espenshade and William J. Serow, eds., "The Economic Consequences of Slowing Population Growth" (New York: The Academic Press, 1978).

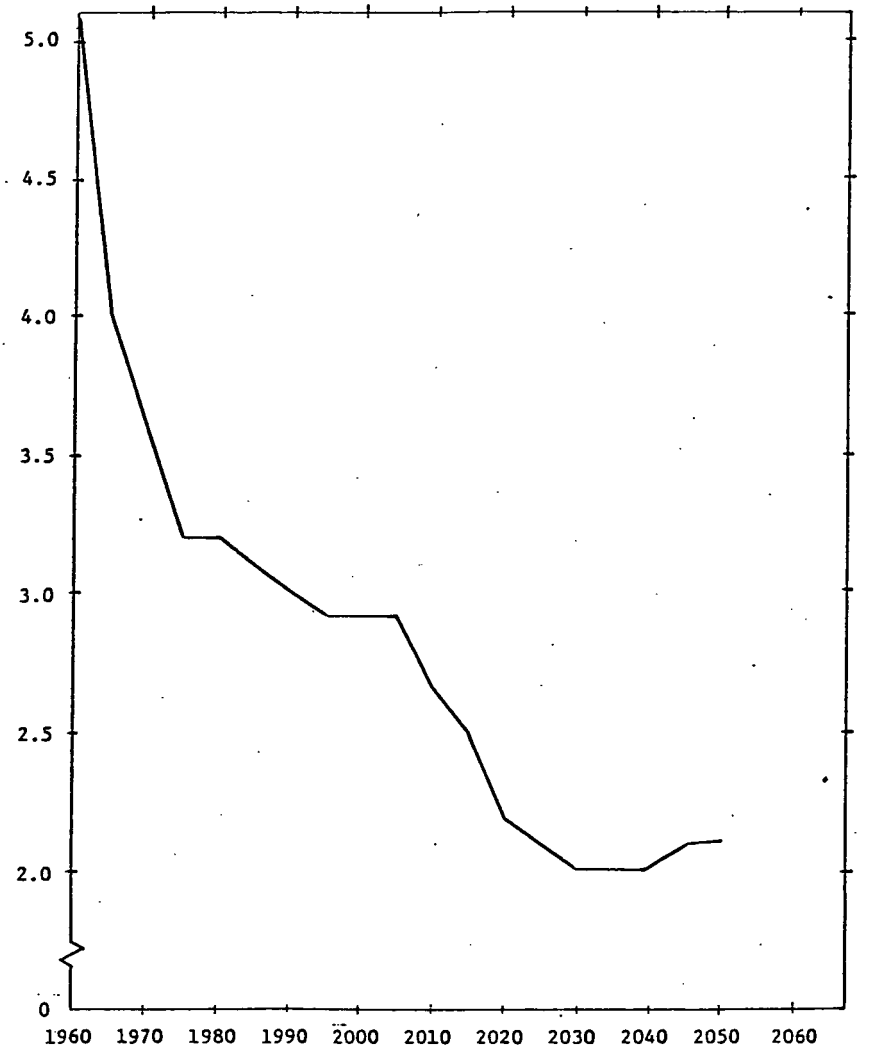
[27] Much of this material and the data are drawn from James R. Storey and Gary Hendricks, "Retirement Income Issues in an Aging Society: The Need for Better Information for Public and Private Decisions" (Washington, D.C.: The Urban Institute, 1979).

[28] Based on the Census, intermediate fertility assumption (Series II). Thus, these are based on an assumed increase from the current fertility rate. If such an increase does not materialize, the percentage of persons 65 and over in the population would rise even more sharply. Thus, these conclusions may be conservative.

[29] Board of Trustees of the Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds and Hospital Insurance and Supplementary Medical Insurance Trust Funds, 1980 Annual Report, June, 1980.

compared with what will be needed to finance benefits under current law.[30]

CHART 5.—Projected number of covered workers per beneficiary, 1960–2050: Old-Age, Survivors', and disability insurance program [1]

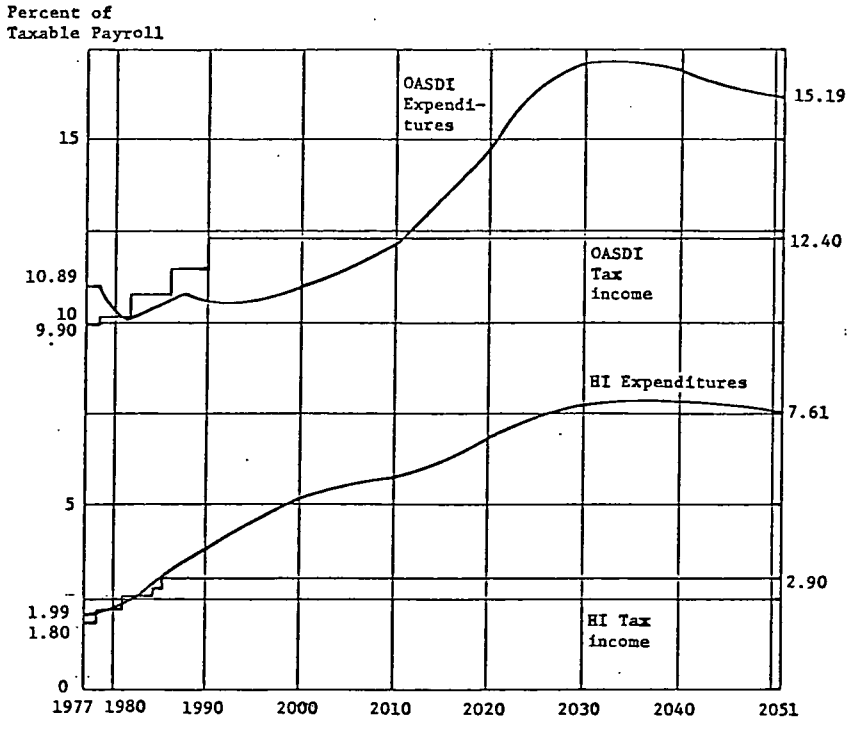


[1] Based on Alternative II of 1978 Trustee's Report: Total fertility rate=2.1, unemployment rate=5.0.

Source: Data from the Social Security Administration. Chart reproduced from U.S. Congress, "Domestic Consequences of U.S. Population Change," report prepared by the Select Committee on Population, U.S. House of Representatives, 1978.

[30] A similar chart based on the 1980 Trustee's Report would show approximately the same picture, with larger short-term deficit.

CHART 6.—Projected OASDI and HI expenditures and legislated tax income as a percent of taxable payroll under 1977 law, 1977–2051.



Source: Data from the Social Security Administration. Chart reproduced from U.S. Congress, "Domestic Consequences of U.S. Population Change," report prepared by the Select Committee on Population, U.S. House of Representatives, 1978.

In addition, the aging of the population will cause other problems. The total number of older citizens will grow steadily, and the over 65 group will contain increasing numbers of the very old. Thus, demands for many supportive and costly specialized services, which tend to increase with age (nursing home care, etc.) will be rising very steeply. Appendix A provides some illustrative projections for a number of specific services to 1990. The potential cost of public funding for these services is enormous.

Given these demographic trends and forecasts, it is easy to see why continuing "business as usual" with respect to retirement policy and health care financing for the aged is already having an enormous impact on the Federal budget and expectations for the future, even without considering other programs needed by the aged. About one-fourth of 1979 Federal outlays will directly benefit the aged through Social Security, Medicare, Federal Employee Retirement, and a number of other programs. Table 3 shows projected future costs of current major programs for the aged. It is based on a number of assumptions, including a return to the "historic" level of Federal expenditures equal to 20 percent of GNP.[31] The elderly's share of the Federal budget

[31] Federal outlays will be approximately 22 percent of GNP in fiscal year 1981, according to the Congressional Budget Office ("Five Year Budget Projections, Fiscal Years 1981-1985."). A number of prominent political leaders are on record as committed to reducing it—including President Carter and many congressional leaders.

will rise slowly and steadily during the rest of this century, reaching 32 percent in the year 2000. It will then leap upward to 42 percent in 2015 and soar to 63 percent by 2025, without any new programs. Since all of these programs are financed by taxes levied on current income, a comparison with total labor income is relevant. As a share of labor income, these benefits will remain fairly stable at 9 to 10 percent until the "senior boom" hits at about 2010. The share then rises to 19 percent by 2025.

TABLE 3.—PROJECTED FEDERAL EXPENDITURES ON MAJOR PROGRAMS FOR THE AGED IN RELATION TO TOTAL BUDGET

[Dollar amounts in billions]

Year	Total budget[1 2]	Spending on aged[2 3]	Percentage for aged	Percentage of total labor income
1979	$499	$131	26.2	8.8
2000	2,155	682	31.6	9.7
2015	5,484	2,320	42.3	13.0
2025	9,449	5,941	62.9	19.3
2015[2]	5,484	1,961	35.8	11.0
2025[2]	9,449	4,376	46.3	14.2

[1] Assumed to be 20 percent of GNP in future.
[2] Assumes a long-run rate of general inflation of 4 percent, health care inflation of 7 percent, real wage growth of 1.75 percent. The alternative projections in the last 2 rows are based on assumed health care inflation of only 4 percent.
[3] Projections of the cost of major existing programs: social security, medicare, SSI, civil service retirement, VA pensions, and railroad retirement.

Source: James R. Storey and Gary Hendricks, "Retirement Issues in An Aging Society" (Washington, D.C.: The Urban Institute, 1979), p. 24, and unpublished projections provided by the authors.

These projections, shown in table 3, are alarming. They are, of course, based on a set of assumptions and are quite sensitive to those assumptions. To show this sensitivity, one alternative projection is included, based on changing one assumption: a reduction of health care inflation to a rate equal to the general rate of increase in the consumer price index. Even then, growth remains very large, as it would with any reasonable set of assumptions. The growth is so large that these projections can be viewed as depicting a world which will not come into existence. But it will require explicit actions to head off this precipitous growth in the share of Federal spending for the aged, which could squeeze out other programs. Actions will have to be taken long before the time comes when a few programs for the aged dominate the Federal budget. Factors that are likely to change the future picture include increasing the normal retirement age under Social Security at some time in the future, placing a lid on health care inflation, and inducing more efficiency in other programs—including better integration of multiple retirement plans.[32]

FEMALE LABOR FORCE PARTICIPATION

Since World War II, women have increasingly entered the labor force on a regular basis. In 1978, the percentage of women over 16 in the labor force reached 50 percent. Growth, shown in chart 7, has been sharper for married women with children living with husbands—including women with children under 6. In 1979, 43 percent of the latter group were labor force members. All indications are that this is

[32] See Storey and Hendricks, "Retirement Income Issues," for a detailed discussion of these and some other options.

a permanent phenomenon and not a temporary aberration. Chart 8 shows labor force participation of women by age for cohorts born at different times. The pattern is quite clear: the more recently a woman was born, the greater her probability of being in the labor force at any age. The youngest group shown—those born between 1956 and 1964 have started entering the labor force at a rate equal to that for young men.[33] If this is a permanent phenomenon, it implies many changes in society and in social policy. Only a few are noted.[34]

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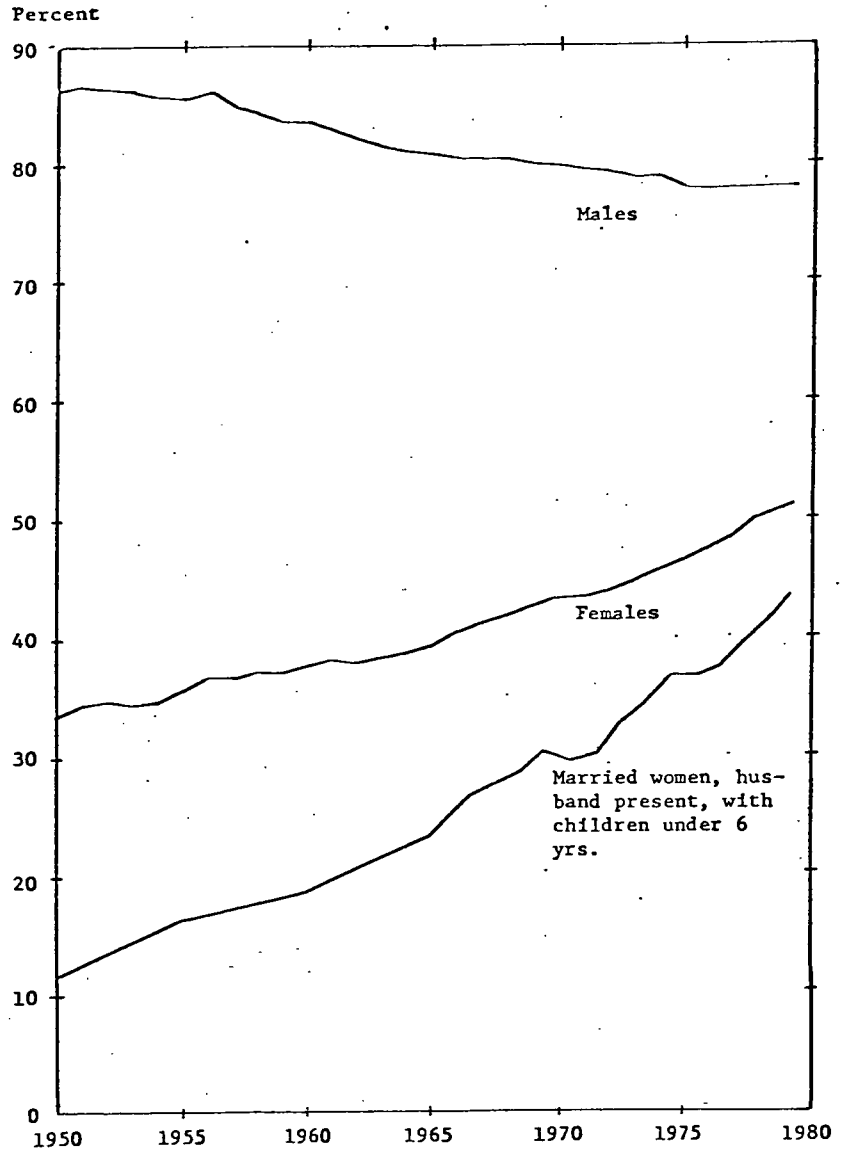
[33] The issues are discussed in some detail in June O'Neill, "Trends in the Labor Force Participation of Women," in Cheryl D. Hayes, ed., "Work, Family and Community: Summary Proceedings of an Ad Hoc Meeting," Committee on Child Develcpment Research and Public Policy, National Academy of Sciences, Washington, D.C. 1980.

[34] These and others are discussed at some length in Ralph E. Smith, ed., "The Subtle Revolution: Women at Work" (Washington, D.C.: The Urban Institute, 1979).

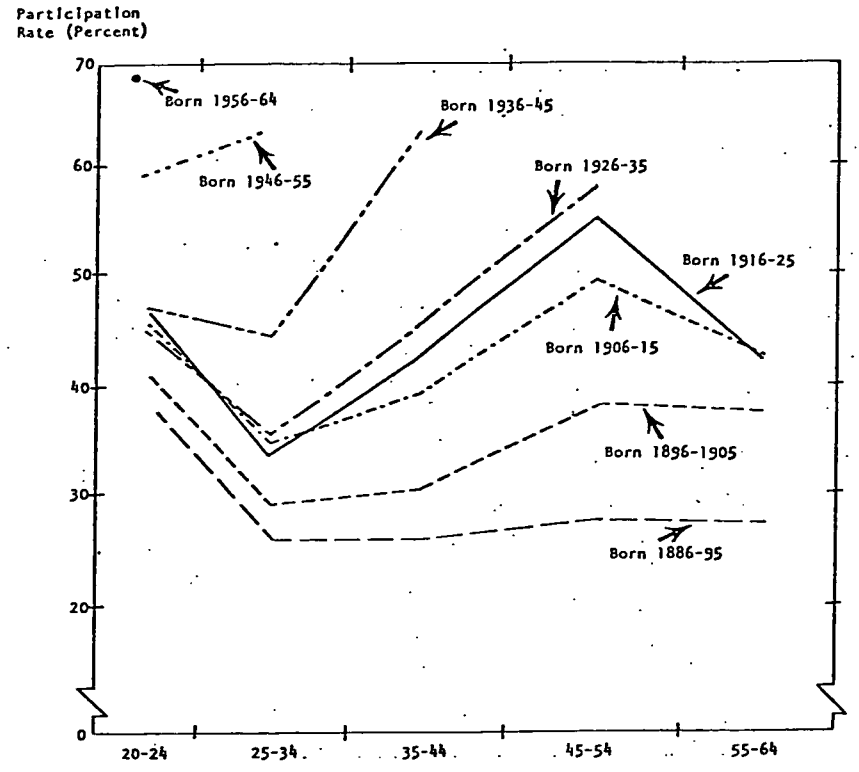
CHART 7.—Labor force participation,[1] by sex, 1950–1979



[1] Civilian labor force members as percentage of noninstitutional population over age 16.

Source: Economic Report of the President, 1980, table B-27, and Employment and Training Report of the President, 1979, table B-4.

CHART 8.—Labor force participation rates over a working life of cohorts of women born in selected time intervals, 1886–1965.



Source: June O'Neill, "Trends in the Labor Force Participation of Women," Appendix A of "Work, Family, and Community: Summary Proceedings of an Ad Hoc Meeting," Cheryl D. Hayes, ed., Committee on Child Development Research and Public Policy, National Academy of Sciences, Washington, D.C., 1980.

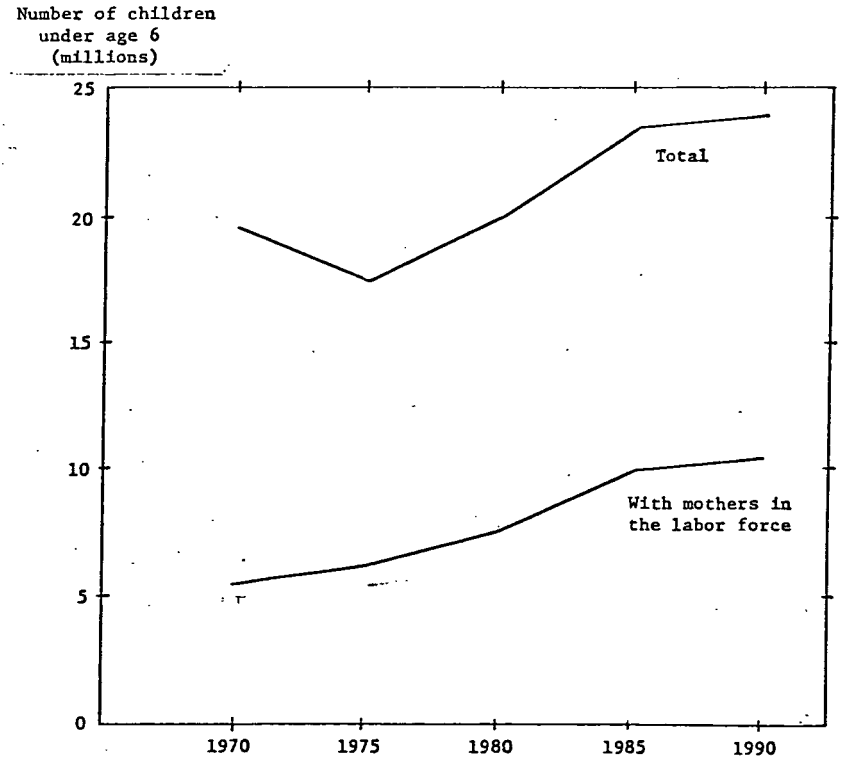
There may be increased pressure for government sponsored child care. The children of the baby boom are beginning to bear their own. Even if, as anticipated, baby boom babies have fewer children than their mothers did, the total number of young children will increase during the next decade. Since 1965, the number of preschool children with working mothers has increased by 65 percent. Between 1977 and 1990 it is likely to increase by another 63 percent—to a projected 10. 5 million compared with 6. 4 million in 1977 (data are shown in chart 9).[35] When most children were being cared for at home by their mothers, the idea of large-scale governmental child care may have seemed an unnecessary, and even undesirable, intrusion into a private family responsibility. (These were the grounds on which President Nixon vetoed the Comprehensive

[35] Detailed data and analyses of these trends can be found in Sandra L. Hofferth, "Family Structure Changes and Child Care," Testimony before the House Select Committee on Population, May 25, 1978; Sandra L. Hofferth *et al.*, "The Consequences of Age at First Childbirth: Labor Force Participation and Earnings," The Urban Institute, Working Paper, 1978; Linda J. Waite, "Projecting Female Labor Force Participation from Sex Role Attitudes," Social Science Research, December 1978; and Ralph E. Smith, "Women in the Labor Force in 1990" (Washington, D.C.: The Urban Institute, 1979).

Child Care Act of 1972, referred to earlier.) Today, however, nearly half of all preschool children have mothers who work. Many individuals, including the working mothers, feel that child care should be provided. Whether government will make another attempt to develop such programs is problematic at this time, given budgetary stringency, but pressures will certainly mount for government action—and expenditures.[36]

A second implication of this phenomenon is that the increasing pressures of the last decade to require welfare mothers with young children to work will probably increase. Political decision makers could justify providing welfare benefits to mothers of young children without imposing a work requirement as long as a nonworking mother staying at home and raising her children was the social norm. The emerging norm seems to be that women with children will routinely work in the market place as well as at home. Exceptions for welfare recipients are not likely to be politically popular.

CHART 9.—Estimates and projections of pre-school-age children with mothers in the labor force, 1970–90 [1]



[1] Projections based on Census Bureau Series II; total fertility rate of 2.1.

Source: Data from Sandra Hofferth. Chart reproduced from U.S. Congress, "Domestic Consequences of U.S. Population Change," report prepared by the Select Committee on Population, U.S. House of Representatives, 1978.

[36] This swell in the size of the preschool population with working mothers may also be a temporary phenomenon. By 1990, this population is expected to have reached its peak. Thus, whatever institutions might develop during the next ten years as a response to increased demand will also be faced with eventual decline.

A third implication bears on fertility. The labor force participation of women has historically been tied to their fertility. Studies have shown that women with a large number of children work less over their lifetimes. A large upturn in fertility could then be expected to reduce women's labor force participation. However, profound changes have occurred in sex role attitudes and in women's roles in recent years. These changes are not likely to be reversed overnight, leading women to stay at home and have babies, even to achieve such a noble social objective as saving the social security system.[38] This argues persuasively against any substantial reversal of the long-term decline in fertility that characterizes this century.

Finally, this trend will have effects on the already troubled social security system. That system, in its benefit structure, is predicated on the assumption that the social norm is for men to work in the market for wages and for women to work at home, supported by their husbands. Payroll taxes finance retirement benefits, which are based on a worker's average monthly covered earnings, and a spouse automatically receives a benefit equal to 50 percent of the worker's basic benefit. Two-earner couples pay taxes on both members' earnings, and the wife receives either the spouse's benefit or her own earned benefit, whichever is larger, but not both. Thus, the combined benefits received by two earners are a smaller proportion of the taxes they paid compared to a couple with only one earner, because of the "free" benefit provided to spouses. This inequity is receiving increasing attention, and possible remedies may add costs to the system in the future.[39]

The Economic Outlook

The past few years have seen a growth in uncertainty and pessimism about the condition of the economy and its future prospects. A detailed analysis of the long-run economic outlook is not presented here, but a few relevant facts will be discussed, which may shed some light on possible future trends in human services. The future performance of the economy will largely determine our financial ability to meet social goals. And uncertainty about the future, or poor economic performance, will have strong impact on the political climate and government's willingness to make further commitments.

In recent years rates of inflation and unemployment have been higher than customary during most of the 1950s and 1960s. This has serious impacts both at global policy levels and at individual household levels. Both are relevant to the future ability to mount human services programs. A third important development is that productivity growth seems to have slowed down considerably in recent years, and potential future real economic growth may be slower than it has been in the past. Past growth in total production enabled the

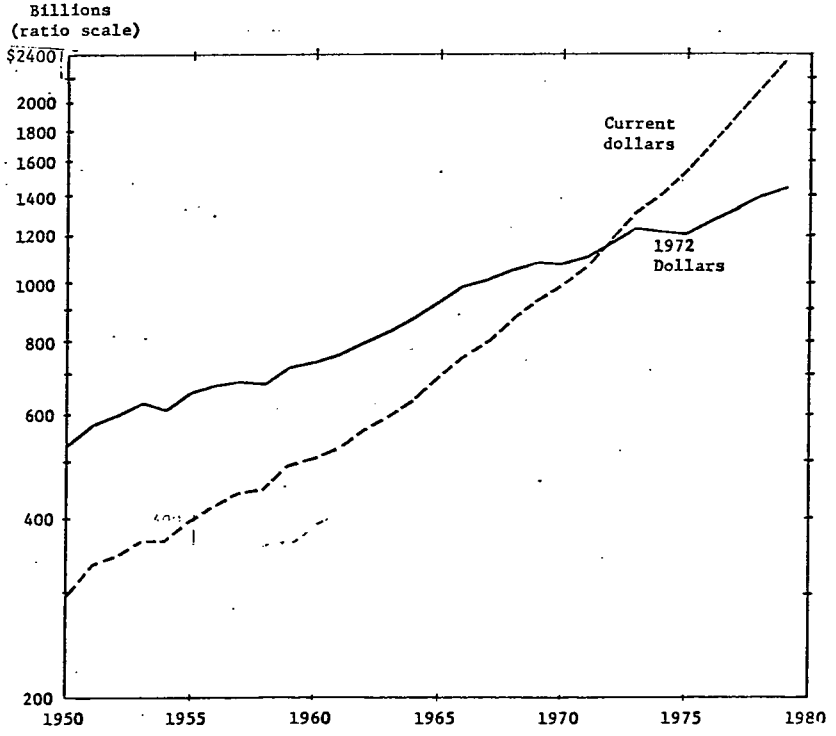
[38] Of course, if female labor force participation continues to grow faster than reflected in official labor force projections, projected revenues to the social security system will be increased, probably by more than benefit costs. One should not, however, count on this windfall as a saving factor, as working women are increasingly recognizing that they are not treated as well under current benefit formulas and are demanding redress as discussed above.

[39] This is an essentially accurate but highly simplified discussion of a complex system. For a more detailed discussion and analysis see Nancy M. Gordon, "The Treatment of Women under Social Security," "Proceedings: Consultation on Discrimination against Minorities and Women in Pensions and Health, Life and Disability Insurance," U.S. Commission on Civil Rights, April 1978.

United States, in the 1960s, to mount major new publicly financed programs without impairing growth in private personal consumption. A decline in prospective real economic growth, if sustained for a long period, will increasingly retard our ability to support public programs.

Chart 10 shows graphically what has happened to overall economic growth since the late 1960s. While current dollar GNP has continued to rise steadily, real GNP declined for two years in the early 1970s, and has grown at a considerably slower rate since. Total real national production is considerably below where it would have been had the growth trend of the 1960s been maintained. Chart 11 shows per capita personal income and consumption, in constant dollars. The drop between 1973 and 1974 was severe relative to past declines, and 1976 barely exceeded the 1973 level.[40] Current levels remain below where they would be had the trend of the 1960s continued.

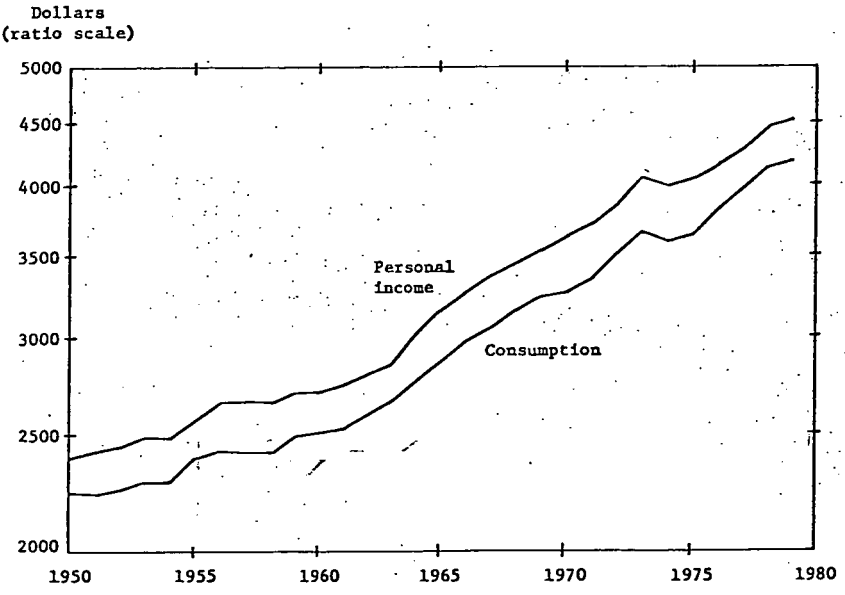
CHART 10.—Gross national product, 1950–79, current and 1972 dollars.



Source: Economic Report of the President, 1980, tables B–1 and B–2.

[40] These two income measures are, in addition, cushioned by government transfer payments. Without unemployment insurance and other income maintenance payments, which rise automatically in a recession, personal income would have fallen further, as would consumption expenditures.

CHART 11.—Disposable personal income and personal consumption expenditures, per capita, 1950–79 (1972 dollars).



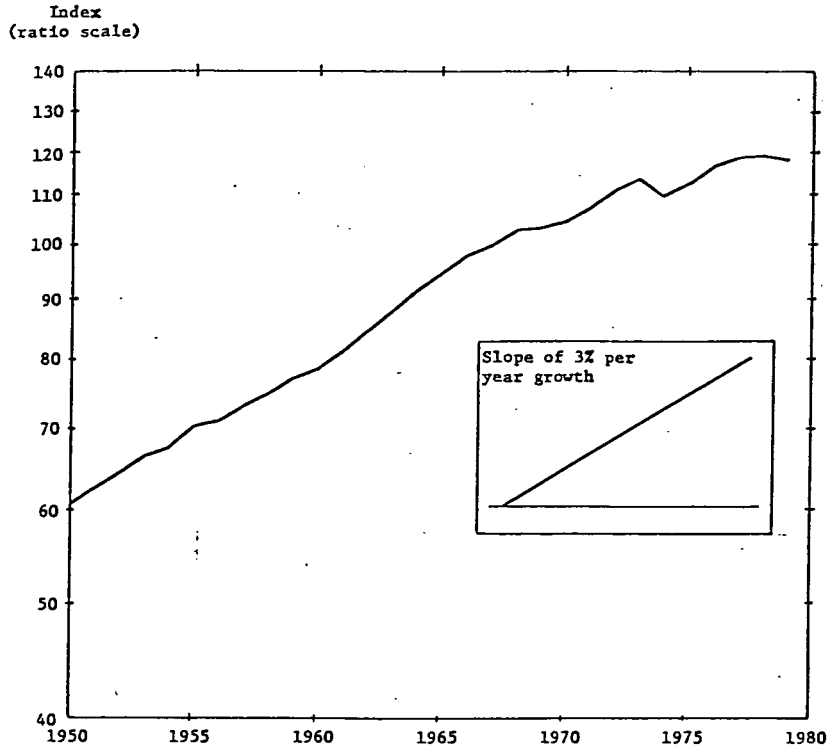
Source: Economic Report of the President, 1980, table B-22.

Chart 12 shows a development of great concern to economists—the trend since 1950 in productivity. Growth in output per hour worked was about 3 percent per year from 1955 to 1965. It started to decline in the mid 1960s, averaging about 2 percent per year from 1965 to 1975. Deterioration then became rapid: from 1973 to 1977 it was only 1 percent; between 1977 and 1978 it was 0.4 percent; and in 1979 we experienced an absolute decline.

There is little agreement among economists on the reasons for this decline, and thus uncertainty as to whether it is a temporary aberration or reflects a permanent, long-term shift toward a more slowly growing economy. Reasons often catalogued, which might account for the deceleration in productivity growth, include a large number of new entrants to the labor force, low rates of capital investment, and increasing costs associated with social and economic regulation.[41]

[41] More detailed discussions are provided in Economic Report of the President, 1979, pp. 69–73 and Economic Report of the President, 1980, pp. 84–88. In the last chapter of a recent work, Edward F. Denison discussed 17 factors that ". . . may have been or may be seriously suggested as important causes of productivity slowdown." After stating, "That I do not know why the record suddenly turned so bad after 1973 must be obvious . . .," he concluded that these factors (which include "People don't want to work anymore," higher energy prices, and others in addition to those noted in the text) do not fully explain the slowdown. See Edward F. Denison, "Accounting for Slower Economic Growth: The United States in the 1970's" (Washington, D.C.: The Brookings Institution, 1979).

CHART 12.—Index of output per hour of all persons in the private business sector, 1950–79 (1967=100).



Source: "Economic Report of the President," 1980, table B-37.

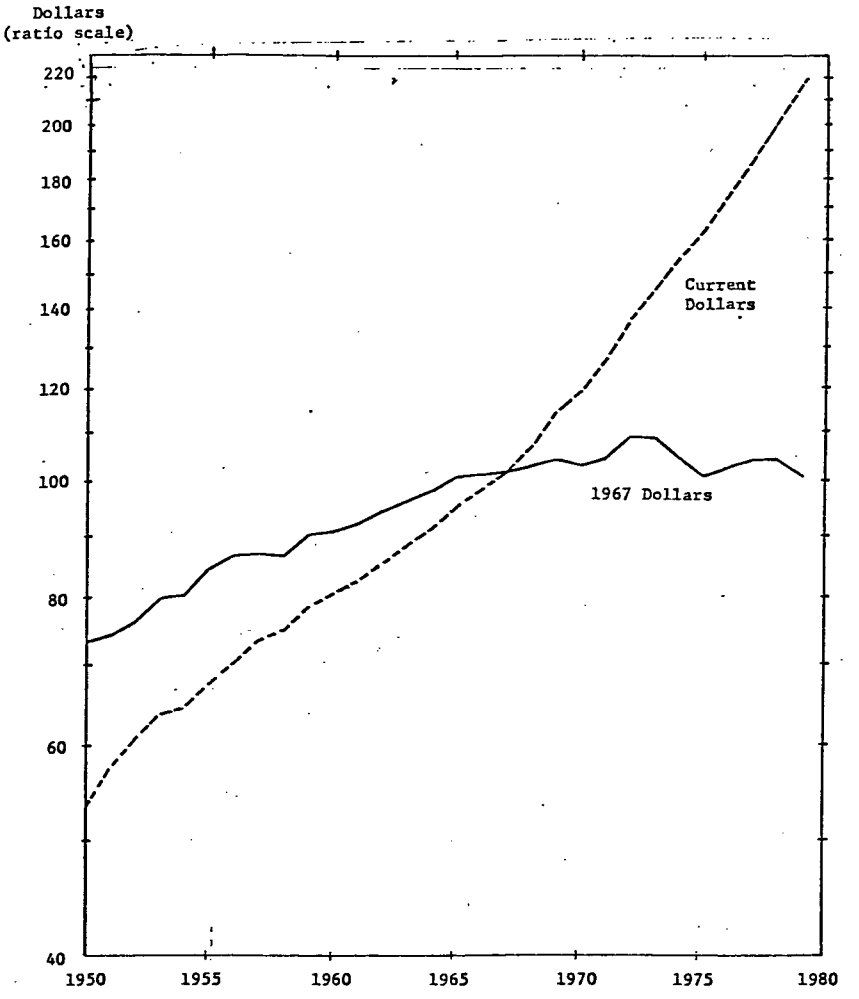
Whatever the reasons, this deceleration in productivity growth, if permanent, might make a difference of over $3 billion per year of new governmental funds available for social welfare purposes.[42] Losing $3 billion of new spending per year implies a drop in the rate of growth in SWE of about 1 percentage point. Thus, if the machine which has driven past economic growth—steadily increasing productivity—is permanently imparied, our ability to continue to pursue simultaneous growth in private and public consumption of goods and services will be lost. Without more knowledge of whether the downward drift in productivity is permanent, it is very difficult to predict the future course of public political decision making with respect to government programs.

[42] This is a very rough calculation, based on assuming a 1 percent per year lower long-run growth rate in GNP. That is, currently about $20 billion less. In recent years, governments at all levels have acquired about 30 percent of any GNP increase through the normal operation of tax systems. Thus, they would lose about $6 billion of growth in total government revenues, about half of which would go to social welfare purposes.

Finally, chart 13 highlights another important economic fact of recent years, which has affected the political climate. Average weekly earnings in private nonagricultural industries have risen steadily and rapidly, but not in purchasing power. In constant dollars, this indicator has declined in recent years. Coupled with slow growth (or no growth) in real earnings, high rates of inflation have had the effect of pushing individuals into higher tax brackets under our progressive personal income tax system. In addition, social security tax rates have been rising steadily—as shown in chart 6. Thus many workers whose gross earnings have increased in parallel with the rate of inflation have found their net real income declining—as they pay higher income and social security taxes. And many workers have found that their gross incomes are not rising as rapidly as necessary to match the inflation rate. The AFL–CIO has neatly characterized this trend, "The American worker is losing ground on a relentless treadmill of living costs rising faster than paychecks." [43]

[43] AFL–CIO, "The National Economy, 1979," reprint from the Report of the Executive Council of the AFL–CIO to the Thirteenth Convention, Washington, D.C., November 1979.

CHART 13.—Average gross weekly earnings in private nonagricultural industries, 1950–79 (current and 1967 dollars).



Source: "Economic Report of the President", 1980, table B–36.

International Events

Our international position has been damaged by recent events abroad. Without discussing specifics, it seems clear that the prospects for long-term peace and stability in international relations are slimmer now than at any time in recent history. The president, with strong bipartisan support, is committed to increased real expenditures for defense and related matters, after some years of decline. Thus, while there is pressure to hold the line on the total budget, spending for defense and international affairs must rise—perhaps by a large amount. This will make irresistable claims upon resources that might otherwise have been available for social program spending.

V. The Emerging Political and Fiscal Climate

Projecting the future of social welfare programs is equivalent to predicting legislative appropriations. Most of the programs of concern have been created and grew to their present prominence through political decisions. Those decisions were based on knowledge or hopes that the expenditure of public funds could alleviate individual and social problems. General prosperity led political leaders to believe that we could afford to make the necessary commitments of funds.

The perceived needs for social service programs still exceed the ability of agencies to meet those needs, based on reports from the field.[44] Politicians thus still feel pressure from both recipients and providers for increased appropriations and additional new programs. They also are increasingly feeling pressure from constituents to reduce tax burdens and the role of government. They are heeding the latter more than they used to, and they are not responding to spending requests as they did in the recent past. The political climate seems to be shifting drastically—and the future may be very different from the past.

The three forces outlined above—very rapid growth in the cost of past commitments, slow economic growth and no fiscal dividends, and deteriorating prospects for world peace—have built up over a number of years. When combined, they are likely to lead to extremely stringent fiscal policies for social welfare purposes for the foreseeable future. The Federal budget will be very tight in the 1980s and beyond, in the sense that simply funding current programs would about exhaust all available resources, with no room for new initiatives—such as liberalizing welfare reform plans and national health insurance—both of which have been much discussed in recent years. It is quite unrealistic to assume that Congress has no other new things to do that call for spending money. Thus, some current commitments are certain to be reconsidered.

This is true in both the short and the long term. It can easily be illustrated numerically for the short term with readily available data. Long-term projections become increasingly unrealistic and subject to greater ranges of uncertainty, but would show similar results. Such projections will be reviewed after a discussion of the changing political climate.

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[44] A recent study of the implementation of Title XX, for example, found that one of the prime concerns of state and local officials who operate the program is the need to raise the dollar ceiling. Bill Benton et al., "Social Services: Federal Legislation vs. State Implementation" (Washington, D.C.: The Urban Institute, 1978). Representatives of providers and recipients of the full range of services are well represented at all budget and appropriating hearings, at which they press for increased funding.

The Changing Political Climate

The growth in spending on income maintenance and a wide range of service programs in the 1960s was documented in part 3. That expansion added millions of persons to the lists of those receiving publicly funded income assistance, health care, and other services. It brought millions of clients into contact with public and private providers of services for the first time. Many of the providing agencies were also new. Providing expanded community-based services became the goal of every social service administrator. Group homes, halfway houses, nursing homes, and community mental health centers became the service facilities of choice and proliferated across the land. Other services expanded as federal funding became available. Day care services for working mothers and their children, home health care services, nutrition services for children and the aged, legal services for the poor, and a host of others were created or received renewed life during the 1960s and early 1970s. Traditional programs such as rehabilitation services expanded as well. This growth also created a growing number of persons whose jobs depend on government programs, both in public and private agencies.

Thus, new and enlarged political constituencies were created—made up of both recipients of government support under various programs and providers employed in the industry administering these programs. This has placed greater pressure on legislators and public executives to continue funding of growing programs. On the other hand, a growing crescendo of demands to "hold the line" on government spending is heard. This is obvious from reading the daily papers. Legislators are increasingly heeding this call, taking action to stop new growth, and in some cases rolling back past growth.

It is easy for supporters of the welfare state to discount the tendency for retrenchment as simply a manifestation of "reactionary" politics and the increasing political organization of a small number of conservatives. It is likely that the cause is much more deeply rooted and general. Manifestations of very deep-rooted feelings about government spending are not hard to find. California voters passed Proposition 13 in 1978, cutting off possibilities of increasing local government taxation and impairing the ability of the state to increase overall state and local spending. Similar measures to retard future growth in public revenues, spending, or both, appeared on 17 other state ballots in November of 1978—and a number passed.[45] Similar initiatives also have arisen at the Federal level. Many State legislatures have endorsed a call for a constitutional convention to adopt a balanced budget amendment—only a few more are needed to reach the required 34 States. During the first month of the 1979 congressional session, more than 50 constitutional amendments to either require a balanced budget or limit Federal expenditures were proposed by members.[46]

There have always been political pressures for cutting taxes and government spending. Why, then, are legislators now heeding the call for retrenchment? Earlier sections have presented data on some of the underlying factors which have shifted. These are as follows:

There is a severe economic pinch operating directly on citizens and on the legislative process. The economy is not growing

[45] Frank Levy, "On Understanding Proposition 13," The Public Interest, summer 1979, pp. 66-89.
[46] Allen Schick, "Constitutional Limitations on the Budget," paper prepared for the Subcommittee on the Constitution, Senate Judiciary Committee, 1979.

rapidly enough to generate sufficiently growing government revenues to finance growth in public spending at historic rates without pain. There is no more fiscal dividend with which public spending can rise while taxes are cut.

The cost of past commitments, driven by both inflation and demographic shifts, is absorbing an increasing share of public resources. Even if economic growth picked up, past commitments for income maintenance and health programs would increasingly absorb funds which might otherwise be available for other programs.[47] Those programs have grown most rapidly in the past 20 years, and further growth is built into them. The "Graying of America" phenomenon alone guarantees that such pressures will be felt for a long time to come. Each year, in addition to cash and health benefits increasing as prices rise, more people are eligible for both.

Increased pressure for spending on defense and international affairs will lead to new pressures to cut back on social welfare programs—to avoid tax increases.

In addition, doubts have sprung up about the effectiveness of many of the new initiatives of the 1960s. Legislators and others are increasingly raising questions about the effectiveness of some programs. Regardless of the merits of particular programs, those doubts provide a convenient basis for holding the line on spending.

I believe that these forces, which have built up over a number of years, will guarantee more stringent fiscal policies for the foreseeable future—certainly through the 1980s. The development of a congressional budget process in 1975, and the public conflict increasingly associated with passage of budget resolutions, is symptomatic of political concern with the need for better overall control over government finances and the difficulty of institutionalizing the ability of Congress to exercise such control.[48]

Budget conflict caused by the factors outlined above became serious in 1979, during debate over budget resolutions for fiscal year 1980. The House Budget Committee proposed a stringent 1980 budget resolution. The committee wished to hold the overall deficit to $25 billion. It was also committed to substantial growth in outlays for large entitlement programs which grow as fast as, or faster than, the CPI, either because they are indexed (social security cash benefits, SSI, food stamps, veterans' pensions, benefits from Federal employee retirement programs) or because they are traditionally adjusted for inflation (veterans compensation) or because they are financing programs in which government simply pays bills generated by industries with higher-than-average rates of inflation (Medicare and Medicaid). Projecting only modest economic growth, continued inflation, and with little political support for major cutbacks in these entitlement programs, the drafters of the Budget Resolution were forced to reach their balance by proposing some small cuts in these programs, larger cuts in other human services programs, and to hold the proposed rate of growth in many others to less than the rate of inflation.[49]

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[47] In budgeteers' jargon, the "uncontrollables" will squeeze the "controllables" out of the budget.
[48] The development of a congressional budget process is briefly discussed in appendix B.
[49] U.S. Congress, House Committee on the Budget, First Concurrent Resolution on the Budget, Fiscal Year 1980, April 1979.

Similar pressures were felt on the Senate side. The Senate Budget Committee, in its deliberations, relied heavily on 5-year projections of revenues and expenditures. Its published projections accompanying an April 1979 report on the first resolution prompted Senator Moynihan to include his own views expressing deep concern that, ". . . a majority of the Committee seems intent on using the budget process . . . to set social policy and tax policy." He went on to note as follows:

> For this year, in guise of forward projections to fiscal 1984, the Committee would all but annihilate social policy for the first falf of the coming decade. In the Committee Report—although I note, not in the Concurrent Resolution—we project a sequence of Federal revenues and outlays which provides no growth in real outlays (in point of fact, a slight decrease) over a full 5-year period. If this were to come to pass, it would mark a policy reversal unlike anything that has occurred in the modern period of American government. It is a vision of social entropy and political regression that has no counterpart in the whole of our history.
>
> This has nothing to do with a balanced budget. It is entirely possible to maintain a balanced budget throughout this period and at the same time to provide the public sector with a reasonable share reassuringly in the growth of the nation's wealth.
>
> For much of the last generation Federal outlays as a proportion of Gross National Product have steadily increased. They were 17% in the mid-1950s, and 20% in the 1960s. By the mid-1970s they had passed 22%. I count myself as one who at that point began to suggest that this expansion of the public sector ought not to go indefinitiely, and probably ought to be cut back.
>
> I welcomed the proposal of President Carter in this year's State of the Union message to reduce the Federal portion of GNP to 21%.
>
> This is stability. It is altogether different to propose, as the Committee majority proposes, to reduce Federal outlays to 17.5% of GNP by 1984. To do so would require either that we sharply cut back the existing activities of the Federal Government, or else abandon any thought of innovative programs for the next half decade.[50]

Congress went ahead in 1979 and adopted budget resolutions and actual spending plans leading to a somewhat larger deficit than desired—$40 billion—only to take up the same battle the following year.

The difficulties of adjusting to the new outlook are clear from observing the Federal Government's budgetary exercises of early 1980. President Carter's January budget received much criticism when it was initially put forward. It was viewed as deficient by many observers because: (a) it was not generous enough to some social programs, or to social programs in general; (b) it did not contain a tax cut proposal; and (c) it had too large a proposed deficit for fiscal year 1981—$16 billion.

By March, arithmetic reality and perceptions of the changed political climate dampened enthusiasm for more spending and tax cuts. President Carter had second thoughts about his January budget in February, and on March 31 he submitted a revised version to Congress. It included reestimates of revenues and outlays (taking new inflation estimates into account), and proposals for some spending cuts, some tax increases, and a modest budget surplus in fiscal year 1981. His staff prepared this new budget at the same time that House and Senate leaders were independently preparing their own version of a balanced hold-the-line-on-spending budget. Executive and congressional budgets reflect great stringency thus far in the process.

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[50] U.S. Congress, Senate Committee on the Budget, First Concurrent Resolution on the Budget, Fiscal Year 1980, April 1979, pp. 329-330.

These 1979 and 1980 political reactions to the emergence of the underlying social and economic forces discussed in part IV do not lead one to great optimism for further rapid growth in Federal spending for social welfare programs. The next section explores the short term outlook for social welfare spending in the light of the recent political climate and the arithmetic.

The Short-Term Budgetary Arithmetic [51]

Budgetary arithmetic dictates that in the next several years, any new commitments to public programs will have to be financed by one of three mechanisms: (1) Giving up some current commitment; (2) deciding to accept a higher effective rate of taxation than exists now; or (3) continuing sizable Federal deficits. The latter two mechanisms seem unlikely to gain political support: they are distinctly unpopular at the moment. Therefore, expenditures will come under increasing scrutiny, and political conflict over allocation of budgetary resources will probably rise.

More specifically, the following political statements seem true:

There will be public pressure to prevent Federal revenues from rising as a percentage of GNP. There are likely to be tax cuts to at least partially offset the effects of inflation. This kind of action would be consistent with history and the expressed intent of the Congress.[52]

Large persistent deficits are viewed as undesirable by a majority of members of Congress. There is strong interest in both Houses in balancing the budget as soon as possible.

The current mix of Federal programs and expenditure levels is not sacrosanct. There will be desires to do some new things and to increase spending on some programs. Some seem inevitable, such as increased resource commitments to defense and international affairs.

If these statements are accepted as true, then the short-term budget outlook dictates serious problems. CBO projections indicate the following:

Revenues.—Federal revenues, under current law, will be about 21 percent of GNP in 1980. They are projected to rise to about 24 percent by 1985. If Congress chooses to cut individual income taxes to offset the impact of inflation, revenues would be brought back down to about 21 percent of GNP in 1985. Taxes could be cut in other ways, with similar revenue effects.

Outlays.—Federal outlays under current law will be 22 percent of GNP in 1980. By 1985 they will decline to 17 percent of GNP if only those programs indexed by law are adjusted for inflation.

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[51] Data in this section are drawn from two sources. The 1985 projections are all from U.S. Congress, Congressional Budget Office, "Five Year Budget Projections: Fiscal Years 1981-1985," February 1980. Base year estimates (1980) are from the President's January budget, "The Budget of the United States Government, Fiscal Year 1981." Specific numbers for 1980 would be changed by using either CBO's February estimates or the President's March reestimates, but the conclusions would remain the same.

[52] For example, the House Budget Committee's "Report on the First Concurrent Resolution on the Budget, Fiscal Year 1981" states, ". . . the goal of tax relief is important to many Members and commitment to that goal is explicit in this resolution." (p. 11). It also notes that such relief should not be considered until the budget is balanced.

If Congress follows its past practice of choosing to adjust a number of other programs to preserve purchasing power, outlays for existing programs would be 20 percent of GNP.

The deficit.—There will be none by 1985. If both current law revenues and outlays are adjusted for inflation as indicated above, revenues will be 21 percent of GNP, outlays 20 percent, leaving a modest surplus of about 1 percent of GNP—or about $60 billion in 1985 dollars. That is about equal to the estimated range of uncertainty in CBO's 1985 projections.

Thus, if the President and the Congress find no new items worthy of being funded in the next several years, all existing programs can be supported (in real terms) through 1985, with a very small budget surplus. This is a quite unlikely outcome. It ignores, for example, all authorizing legislation now in process under consideration by Congress. It also ignores the President's commitment—shared by many—to make real increases in defense spending. It ignores other ideas for programs that are not far enough along in development to be enshrined in a bill, but which Congress may wish to consider in coming years. For example, there are current proposals in various stages of discussion which would provide a better deal to working women under the social security system, protect the poor from rising energy costs, and invest heavily in alternative energy sources; as well as the welfare reforms and national health insurance plans already mentioned. All of these may be good things—but most would not fit within the budget balance outlined above.

History indicates that Congress and the President are unlikely to opt for maintenance of the status quo. Any significant movement from the status quo involves redistribution of funds from current programs to new ones.

Table 4 shows Federal outlays for selected years for selected functions, and CBO's 1985 projections, including discretionary inflation adjustments. The fast growth period alluded to earlier, 1965–1975, is broken into two five-year periods. Most of the rapid growth shown for those years was, as indicated earlier, induced by discretionary actions: liberalization of old programs and adoption of new ones. The 1985 projections omit any such possibilities and lead to a budget with a very slight surplus.[53] The set of Federal budget categories that roughly coincides with the SWE data presented earlier is projected to grow slightly less than GNP. Most rapid growth is built into health and income security programs, and within functions it is concentrated in the entitlement programs for the aged as noted earlier. These grow faster than GNP. Other functions fall considerably behind.

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[53] As this is being written, the economy has entered a recession. A severe recession of any duration would drastically alter all of these projections. Outlays would rise as automatic transfer payment programs expanded, and revenues would decline. A balanced budget would be most unlikely for the next several years without major programmatic cutbacks.

TABLE 4.—FEDERAL OUTLAYS FOR SELECTED FUNCTIONS, SELECTED FISCAL YEARS 1965 TO 1980 (ESTIMATE) AND 1985 PROJECTED UNDER CURRENT LAW WITH DISCRETIONARY INFLATION ADJUSTMENTS

[Dollar amounts in billions]

	1965	1970	1975	1980, estimated	1985, projected	Average annual percent change 1965–70	1970–75	1975–80	1980–85
Budget category:									
Community and regional development	$0.3	$2.4	$3.7	$8.5	$12	52.3	9.6	17.8	7.2
Education, training, and social services	2.3	8.6	15.9	30.7	44	30.4	13.0	14.1	7.5
Health	1.7	13.1	27.6	56.6	109	50.3	16.2	15.4	14.0
Income security	25.7	43.1	108.6	190.9	330	10.9	20.3	11.9	11.6
Veterans benefits and services	5.7	8.7	16.6	20.9	30	8.7	13.9	4.6	7.6
Subtotal	35.7	75.8	172.5	307.4	525	16.2	17.9	12.2	11.3
Defense and international affairs	53.9	82.9	92.5	140.8	218	9.0	2.2	8.8	9.1
Other [1]	28.8	38.0	61.2	115.4	132	5.7	10.0	13.5	2.7
Total	118.4	196.6	326.2	563.6	875	10.7	10.7	11.6	9.2
Gross national product	657.1	959.0	1,457.3	2,518.0	4,400	7.8	8.7	11.6	11.8
SWE as percent of GNP	5.4	7.9	11.8	12.2	11.9				
Total as percent of GNP	18.0	20.5	22.4	22.4	19.9				

[1] Includes all other functional categories shown separately in budget documents.

Sources: Historical data from U.S. Government, Office of Management and Budget, "Budget of the United States Government," fiscal years 1975, 1980, and 1981. Projections to 1985 from U.S. Congress, Congressional Budget Office, "Five-Year Budget Projections: Fiscal Years 1981–1985," February 1980. Some reclassifications of expenditures among functions were made between the 1975 and the 1980 budgets. These have not been corrected in this table as they do not significantly affect the analysis.

Any new discretionary spending decisions made during the next few years will change the picture for the worse. This is illustrated in table 5, which shows the revenue and spending picture under two different assumptions about growth in spending for defense and international affairs.

If defense and international affairs spending grows by 3 percent per year in real terms until 1985, the projected surplus is reduced to $25 billion.

If defense and international affairs spending grows by 5 percent per year in real terms over the same period, the projected surplus is reduced to zero.

Neither is a prediction—but they illustrate how slight the projected budgetary surplus is in the face of any new demands that may be made.

In effect, any significant new expenditure program or expansion of existing programs can be financed only by forgoing the tax reductions assumed above, given a desire to avoid deficits.

TABLE 5.—FEDERAL OUTLAYS AND REVENUES, FISCAL YEARS 1980 (ESTIMATED) AND 1985 PROJECTIONS[1]

[Dollar amounts in billions]

	1980, estimated	Projected 1985		
		I	II	III
Expenditures:				
SWE	$307.4	$525	$525	$525
Defense and international	140.8	218	253	278
Other	115.4	132	132	132
Total	563.6	875	910	935
Revenues	523.8	935	935	935
Surplus (deficit)	(39.8)	60	25	0

[1] Projection I is from U.S. Congress, Congressional Budget Office, "Five-Year Budget Projections: Fiscal Years 1981–1985," February 1980. It includes current law plus discretionary adjustments for inflation in both outlays and revenues. Projections II and III are derived by increasing CBO's projection for defense and international affairs by 3 percent and 5 percent per year respectively, to reflect growth in addition to the inflation adjustment included. Estimates for 1980 are from U.S. Government, Office of Management and Budget, "Budget of the United States Government," fiscal year 1981.

The Longer Run

As indicated in part 3, the fiscal tightening for social welfare purposes has already shown up nationally, with a slowdown in the growth of social welfare spending. Table 4 indicated that Federal Government spending for such purposes only slightly outgrew GNP between 1975 and 1980, after growing about twice as fast in the previous 10 years. It is projected to grow more slowly than GNP in the next 5 years.

Legislators will have a difficult time in the coming years—they want to continue to consider desired and popular programs demanded by constituents, but they also want to control spending and reduce taxes. The arithmetic shows clearly that they will be hard pressed to do both.

This leads to the inevitable conclusion that:

Social welfare programs of all sorts will be badly squeezed. Growth in Federal spending for current purposes may have to fall significantly short of the rate of inflation if any new programs or discretionary increases in other expenditures are adopted.

With enormous pressure to maintain the extremely popular social security and health care financing programs, other human service programs are likely to bear the brunt of any cuts.

This is, of course, not a statement of preferences, but rather a view of what the arithmetic seems to dictate. It is almost certainly inescapable for the short run. It is likely to continue for the longer run as well.

At this point it should be clear that the future is too uncertain to allow making firm long-run quantitative projections about the future of specific social welfare programs. Two additional imponderable considerations should be added to that uncertainty.

James L. Sundquist of the Brookings Institution, in writing about the legislative activism of the 1960s, viewed the period from 1953 to the late 1960s as an upswing in a political pendulum in a cyclic policy-making process—shifting from a conservative position in the 1950s, with few major new initiatives, to a rapid liberal expansion in the early and mid-1960s. He concluded that it was impressive:

> . . . not only in its rhythm but in the aura of inevitability about the outcome. The ultimate results were, in a sense, compelled by the circumstances of the problems themselves. Though the imagination and skill and doggedness of the political actors were indeed remarkable, these men nevertheless seem as actors, ollowing a script that was written by events.[54]

If such a cyclic view is accepted, then we may now be on a strong downswing from the activist side of the cycle. Thus, we would seem to be heading for troubled times in the public financing of social welfare programs. This is consistent with the interpretation of recent events outlined above. But as noted earlier, the difference in the rate of growth of the 1950–1965 and 1965–1975 periods was not between no growth in expenditures and high growth. It was the difference between growth in social welfare spending of 1.3 percent per 1 percent growth in GNP in 1950–1965 versus 1.6 percent in the period 1965–1975. This would tend to indicate that we may not see sharp retrenchment in levels, but rather a holding of the line on rapid growth. On the other hand, so much automatic growth has been built into large existing income maintenance and health programs that the possibilites for any growth in discretionary programs, including most other human services programs, seem slight, unless the political climate swings into another cycle that permits total spending to rise relative to GNP, with concomitant tax increases.

Finally, in assessing the long term, the ramifications of a possible constitutional amendment must be taken into account. It was noted earlier that there seems to be growing political support for such action. Allen Schick, in an analysis of leading proposals, has noted both that the purpose of such proposals is not clear and that their outcome would be uncertain. He concludes as follows:

> . . . the proposed spending limitations mask their real purpose, a radical transformation in the character, reach, and purpose of the United States Government. The extent to which the trend toward active government would be reversed would depend on (1) the type of limitation written into the Constitution, and (2) the willingness and ability of the Government to do via other means that which it could no longer do via the budget. While one should not underestimate the ingenuity which surely will be applied to evade the controls or to act in nonbudgetary ways, there is no escaping the prospect that a federal government operating under a constitutional straightjacket would be markedly different than one which is unfettered and can decide what and how to execute its will. The differences might be in the walling off of major segments of government from popular and legislative control through the expansion of "quasi" governments. They might be reflected in an untangling of the relationships that have grown between the federal and state and local governments, along with a dispersion of power and money from the center to states and municipalities. Change might come through a contraction of America's presence on the world scene or through

[54] James L. Sundquist. "Politics and Policy," p. 507.

greater reliance on market mechanisms to provide "social" goods and services and to manage economic affairs. The list of possible mutations certainly is endless, and yet no list could comprehend the full range of intended and unintended possibilities.[55]

Whether or not any such limitation on taxing and government spending is ultimately adopted, the idea is apparently very popular with the public and with many political leaders. The possibility of adoption of some such limitation may act as a severe brake on growth in the public sector for the foreseeable future.

Appendix A

Implications of an Aging Population for Selected Social Services Programs

The years ahead are likely to bring great shifts in the amounts and types of social service programs demanded in America. Significant sociodemographic changes are taking place which will place new requirements on social service agencies by the year 1990. One of the most dramatic of these is the inexorable aging of American society, as the birth rate falls and the life span of the average citizen increases. This trend will continue into the 21st century.

This trend was discussed in the body of the paper, where the focus was on retirement income programs. An understanding of this phenomenon is also important for effective long-term planning of social services. This appendix presents a more detailed analysis of potential impacts on a number of specific service programs in the intermediate-term future—looking ahead to 1990.[56]

Characteristics of the Elderly Population

In addition to the general increase in the size of the population aged 65 and older, some important demographic changes are taking place within the elderly population:

The elderly population is increasingly made up of the "older old." That is, the population aged 75 and older has grown, and will continue to grow, at a faster rate than the rest of the elderly population.

Women will constitute an even larger proportion of the elderly population than they do now.

The proportion of the elderly population which is nonwhite will increase.

These internal changes are taking place because these are the groups which have benefited the most from recent mortality reductions. The increase in the proportion of elderly persons who are female and nonwhite is also important. Women, particularly those who are single, and the nonwhite elderly generally, have lower retirement incomes than their white male counterparts. Thus, their need for government transfers in the form of cash income or special services is often greater than that of higher income white males. Table A–1 shows these changes in the demographic structure of the elderly population projected to 1990. The trends mentioned above are already evident by 1990 and are expected to accelerate in later years.[57]

The oldest subgroup of the elderly population shows particularly marked growth from 1977 to 1990. In this 14-year time span the fraction of the elderly population which is age 75 and older rises by 7 percent. This is an important change in the structure of the elderly population because dependency tends to rise with age. The incidence of disabling conditions which prevent self-sufficiency is significantly higher among persons 75 or over than among persons under 75 and becomes especially marked among the population 85 and over.

The trend toward an increase in the proportion of the population that is elderly will result in greater demand for a number of social services.

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[55] Allen Schick, "Congressional Limitations on the Budget," p. 33.

[56] This appendix is based on unpublished materials developed by Burton Dunlop of The Urban Institute, and a forthcoming paper by Richard Wertheimer and Sheila Zedlewski, "The Aging of America: A Portrait of the Elderly in 1990" (Washington, D.C.: The Urban Institute, forthcoming).

[57] "Demographic Aspects of Aging and the Older Population of the United States," Current Population Reports, Series P-23, No. 59, U.S. Department of Commerce, Bureau of the Census, May 1976.

TABLE A-1.—SELECTED CHARACTERISTICS OF THE ELDERLY POPULATION IN 1977 AND 1990 (PROJECTED)

Characteristics of the elderly population	1977	1990
Total population aged 65 and older (thousands)	23,431	29,822
Percentage:		
Aged 65 to 74	62.2	59.7
Aged 75 plus	37.8	40.3
White	90.7	89.9
Nonwhite	9.3	10.1
Male	40.7	40.2
Female	59.3	59.8

Source: Computed from series II projections in "projections of the United States Population: 1977 to 2050," Current Population Reports, series P-25, No. 704, U.S. Department of Commerce, Bureau of the Census, July 1977.

Several of the most basic services that will be affected are identified below, in order to illustrate some of the changes that may be expected.

Home Care Services for the Elderly

The number of elderly persons receiving home care services under the Medicare, Medicaid, and Title XX programs approached 1 million people in 1976 (see table A-2). Medicare and Medicaid provide primarily skilled nursing care and home health assistance. Under Title XX, the primary service is that of homemaker.

TABLE A-2.—*Number of Elderly recipients of home care services by program in 1976*

Program:	*Number of elderly recipients*
Medicare	547,770
Medicaid	235,198
Title XX	82,500
Total	865,468

If the same proportion of the total elderly population receives home care services in 1990 that received such services in 1976, the size of the elderly population receiving home care services will be 1.1 million people, a 27-percent increase. Such a projection is probably quite conservative, since past growth has been much more rapid. Between 1974 and 1976, the number of home health care recipients increased by 50 percent under Medicare and 74 percent under Medicaid. Under Title XX, the increase in homemaker services between 1976 and 1977 was 18 percent. In other words, projection of the demand for home health care services that is based on today's proportion of elderly persons receiving such services may significantly understate the future demand, but existing information for estimating future growth rates is inadequate.

Nursing Home Care Services for the Elderly

The number of persons requiring nursing home care services will increase rapidly between 1980 and 1990, and this increase will continue through the year 2000. The estimates in table A-3 are derived by applying nursing home utilization levels by age category of the elderly population in 1975 to projected population size by those same age categories in 1980, 1990, and 2000. This assumes that the quantity of beds supplied in the future will bear roughly the same relationship to total demand that has existed over the relatively recent past. If these assumptions hold, by 1990 1.6 million aged will be in nursing homes, compared to about 1 million currently.

TABLE A-3.—PROJECTIONS OF U.S. ELDERLY POPULATION IN NURSING HOMES THROUGH YEAR 2000, BASED ON CURRENT NURSING HOME UTILIZATION RATES BY AGE CATEGORY AS OF 1975[1]

[Amounts in thousands]

Age	Percentage of elderly population in nursing homes	Projected total elderly population			Projected numbers in nursing homes		
		1980	1990	2000	1980	1990	2000
65 to 74	1	15,493	17,803	17,436	155	178	174
75 to 84	6	7,140	9,140	10,630	428	548	638
85 plus	22	2,294	2,881	3,756	505	634	825
Total		24,927	29,824	31,822	1,088	1,360	1,638

[1] Eighty-five to eighty-eight percent of the nursing home population is 65 yr of age or over.

Sources: Zappolo, Aurora, "Characteristics, Social Contacts, and Activities of Nursing Home Residents," Vital and Health Statistics, series 13, No. 27, p. 3; Siegal, Jacob S., "Demographic Aspects of Aging and the Older Population in the United States," Current Population Reports, series P-23, No. 59, table 2-1, p. 3; Siegal, Jacob S., "Recent and Prospective Demographic Trends for the Elderly Population and Some Implications for Health Care," paper prepared for publication in the Proceedings of the Second Conference on the Epidemiology of Aging, Mar. 28-29, table 1.

Domiciliary Care Services for the Elderly

As retirement incomes and education levels (and perhaps health status as well) rise among the elderly during the next decades, there will be an increase in demand for domiciliary care services, although the services demanded may be somewhat different. Facilities that provide domiciliary care services include adult care homes, homes for the aged, personal care homes, shelter care homes, etc. Whether the demand from this growing segment of elderly in a higher socioeconomic status will be met publicly or through private means depends in part on whether or not eligibility levels for public programs are raised to match increases in income levels, and whether or not the sliding fee scale comes to dominate human services delivery. At any rate, the elderly appear likely to demand, to a greater degree, those services which allow them maximum independence.

A rough estimate of the number of persons currently receiving domiciliary care services exclusive of congregate housing or assisted independent living is approximately 500,000. The elderly would constitute 40 percent, or 200,000, of these. While this number represents less than 1 percent of the total elderly population, the projected elderly DCH population would be a quarter of a million in 1990. As indicated above, this is likely to be a rather conservative estimate of total demand for domiciliary care services since the average income of an elderly person in 1990 is expected to be higher, in real terms, than it is today. Thus, a greater proportion of the elderly would probably choose retirement villages, congregate housing, assisted independent living settings, and full-service communities, perhaps with continuing care arrangements, than currently occurs.

Other Relevant Factors

Other factors that need to be included in any finer-tuned projections of demand by the elderly for the types of long-term care services used here as illustrations, as well as for other social services, deserve mention:

- Later retirement would enhance the financial status of the elderly and, presumably, lower their demand for publicly funded services.
- Improved levels of health would lessen demand for health care, although the changing age and sex mix of the population may change the composition of demand for medical services.
- Higher educational levels and higher incomes could be expected to increase demand for preventive health services and perhaps other social services, especially those services which are nonmeans tested.

Since a spouse, if present, typically becomes the dominant source of assistance when dependency strikes, higher rates of marriage among the younger elderly population would act to lessen the demand for formal social services. On the other hand, projected increases in widowhood among the older elderly population would increase demand for formal services.

Lower fertility rates will mean fewer adult children to provide filial support to the dependent elderly—at least until the parents of the baby boom cohort reach old age. In this regard, the dependency ratio of those, say, 80 and over to those 55–74 bears especially close watching.

Any increased labor force participation of women, especially those 55 and over, who traditionally have been the principal care-givers to impaired elderly relatives, could mean lowered familial capacity to provide long-term care.

Increasing rates of marital dissolution may harbor potential further diminution of familial capacity to provide informal support.

All of these factors, which cannot be readily quantified, make projections of demand for specific services highly uncertain.

Appendix B

Congressional Budgeting

Concern over the rate of growth in public spending is not new. Debate between conservatives and liberals took place throughout the expansionary period of the 1960s. From 1969 to 1976 Republican Presidents Nixon and Ford engaged in a running battle with Democratic-controlled Congresses over spending. Many Democratic members of Congress agreed in principle with many of their concerns but continued to churn out increasing appropriations for particular programs, while expressing concern in general for the total. Recognizing the problem of controlling totals when the legislative process dealt separately with each part of the budget, Congress developed and implemented new budgeting procedures in 1975, based on the Budget and Impoundment Act of 1974. A new Congressional Budget Office was created, and Budget Committees were created in both the House and the Senate. The potential impacts of these new practices are profound and quite relevant to future growth in government activities in human services.

Under the new procedures, a joint resolution must be passed by both Houses each spring. This resolution sets an overall expenditure target, expenditure targets by functional areas, a revenue target, and explicitly defines the expected Federal surplus or deficit. In general, no bill which affects revenues or expenditures can be considered by Congress until that resolution has been passed. In the fall a second resolution must be passed, which establishes firm ceilings. After all money bills are acted on, if the totals are out of line with the second joint resolution, they must be reconciled to the ceilings. In the process of developing resolutions, the committees rely on the Congressional Budget Office and their own technical staffs to assess and choose economic assumptions, and they review five-year forecasts projecting the implications of their decisions.

This process strongly reinforces already existing pressures on Congress to be fiscally responsible in its actions. An open vote must be taken on the overall budget as well as on particular bills. When members push for enactment of particular expenditure increases or revenue cuts not incorporated in the resolution, they will also have to publicly support an increased deficit. Members have found it increasingly difficult to publicly favor fiscal responsibility but support every "good" program they are asked to support and tax relief too. Some observers have argued that Congress will behave more conservatively in the future because of this change. Fiscal responsibility and conservatism do not have to be viewed as synonymous to suspect that it will indeed be harder for new or expanded "liberal" programs to be enacted, once explicit choices within a total budget are required.[58]

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[58] For a detailed review of the legislative history and implementation of the Congressional Budget Act see Allen Schick, "Congress and Money: Budgeting, Spending, and Taxing" (Washington, D.C.: The Urban Institute, 1980).

THE ROLE OF INTERGOVERNMENTAL GRANTS IN THE U.S. ECONOMY WITH SPECIAL ATTENTION TO COUNTERCYCLICAL POLICY

By Wallace E. Oates*

CONTENTS

Under a federal system of government, the public sector is not a single, monolithic decision-making structure; it is, rather, a highly fragmented collection of agents working in the context of a constitution which outlines (often only very roughly) the scope of independent responsibilities and powers of the different levels of government. In the abstract, we can envision each level of the public sector setting about its own business; Lord Bryce, late in the nineteenth century, described a federal system in terms of ". . . a great factory wherein two sets of machinery are at work, their revolving wheels apparently intermixed, their bands crossing one another, yet each doing its own work without touching or hampering the other." [1]

In practice, however, federal systems have evolved in sharp contrast to the Bryce conception. We live in an age of "cooperative federalism" in which the activities of different levels of government are enmeshed to a very high degree. The objective and responsibilities of Federal, State, and local governments overlap and their operations impinge upon one another to such an extent that it is simply impossible to set forth autonomous or independent functions for the various governmental levels. Instead, the central problem becomes one of integrating budgetary and other decisions of different public units into a coherent and, to the degree possible, a consistent set of policies.

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[1] Lord Bryce, "The American Commonwealth" (New York: Macmillan, 1896), p. 325.

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It is largely from this perspective that intergovernmental grants have come to play a central role in the fiscal structure of nearly all federal governments. Such grants have proved to be a highly flexible fiscal instrument with which one level of government can provide both inducements and assistance to another in a way that promotes the objectives of the public sector as a whole. There remain compelling advantages, for example, for retaining a large measure of fiscal discretion at highly decentralized levels of government; State and local governments are in a position to tailor their programs to the particular needs and preferences of their own constituencies. At the same time, the Federal Government has its own set of allocative and distributive responsibilities and priorities. But rather than preempt State and local choice (which is often unconstitutional, as well as unwise), the Federal Government can induce State and local officials to take account of the national interest through a set of grants that provides direct fiscal incentives for expanding those activities that confer benefits on the rest of the Nation (or, alternatively, to curtail those that have detrimental external effects).

Intergovernmental grants thus constitute a powerful policy tool for the integration of decisions by different levels of government. As such, it is not too surprising to find that these grants have exhibited a dramatic historical growth. In the United States, for example, Federal grants to State and local governments totalled about $2½ billion in 1950 (about 5½ percent of Federal expenditures); by 1977 these grants had reached over $60 billion (approximately 15 percent of total Federal outlays).

This paper explores the role for intergovernmental grants both in theory and practice. Part I examines, first, what the principles of economics suggest for the appropriate employment of such grants, and second, the actual range of uses and the growth of intergovernmental grants in the United States. As such, Part I is intended to provide an overview of the potential and actual roles of intergovernmental grants in the United States; it calls attention to some of the basic issues in the design of these grants, but does not attempt a careful assessment of individual grant programs. Part II is a more detailed study of the particular and relatively recent use of grants as a tool of macroeconomic stabilization policy. Drawing both on U.S. experience and that of other federal countries, Part II explores the need for and the potential of intergovernmental grants as an addition to the Federal government's set of countercyclical policy instruments. Finally, Part III evaluates the role of grants with a special eye to their future deployment in the U.S. economy.

I. Intergovernmental Grants: An Overview

The public sector as a whole has a range of different responsibilities: Corrections in the allocation of the economy's resources in instances where market choices generate significant distortions; the redistribution of income in accord with society's view of an equitable income distribution; the stabilization of the economy at high levels of employment with reasonable price stability; and the attainment of an acceptable rate of economic growth. In the pursuit of each of these objectives, the Federal government (and the States as well) has employed a variety of forms of intergovernmental grants. This raises

the issue of the appropriate form of grant to achieve a specific goal, an issue on which the basic principles of economics can shed some light. Part I thus begins with a brief examination of the general principles of grant design.

A. External Effects Across Jurisdictions: A Role for Matching Grants

An important potential source of distortions in allocative decisions exists whenever the choices of one individual or group of individuals impinge significantly on the welfare of others in the absence of any payment mechanism. The classic example in economics is that of the factory spewing forth smoke which imposes external costs on the neighboring laundry. In this case, the decisionmaker (the factory owner) has no incentive to take account of the costs (or benefits) that he or she generates for third parties so that these economic choices fail to incorporate the full range of social costs or benefits that are relevant to the decision.[2] The likely consequence is a distorted pattern of resource use with excessive levels of activities generating external costs and inappropriately low levels of those that produce spillover benefits.

External effects are not limited to decisions by private consumers or firms. The programs adopted by one local or State government may have important implications for the welfare of residents of other jurisdictions. A good system of roads in one locality, for example, provides services for travelers from elsewhere. Likewise, research activities in the hospitals funded in one State may produce new treatment or cures of widespread interest. In such instances, we can hardly expect the State or locality to draw on its own resources to expand the activity to levels for which outsiders would be willing to pay if some payment mechanism existed. From the perspective of the Federal Government, such myopic decisions on the part of States and localities are a matter of serious concern for programs where external effects are important.

As a representative of the national interest, the Federal Government could in principle respond by simply taking over the whole function and thereby "internalizing" all the relevant costs and benefits. Oftentimes this response is simply unconstitutional or for other reasons politically infeasible. But even were it a viable alternative, this is frequently a case where the cure may be worse than the disease. The decentralized provision of public services offers some quite compelling advantages for the efficient use of resources. Most important, a State or local government is in a position to fashion its programs closely in accordance with the particular tastes of its constitutency. Were the central government to take over the service and establish, say, uniform levels of output across all jurisdictions, quite significant welfare losses would be a likely result. There are nearly always important welfare-enhancing forces associated with allowing individuals or small groups of

[2] In certain instances where the affected parties are able to come together and negotiate an agreement, Ronald Coase has shown that voluntary private decisions can yield an efficient outcome. See his "The Problem of Social Cost," Journal of Law and Economics, 3 (October 1960), pp. 1–44. However, the Coase resolution of externalities relies on a number of quite restrictive assumptions such as low transactions costs and an absence of strategic behavior: these considerations suggest that its relevance is limited to cases involving only a very small number of participants. On this matter, see William Baumol and Wallace Oates, The Theory of Environmental Policy (Englewood Cliffs, N.J.: Prentice-Hall, 1975), Chapter 2.

individuals to determine their own most appropriate levels of services instead of having them imposed from the center.[3]

Rather than preempting State-local outputs of services involving external effects across jurisdictions, the Federal Government can resort to intergovernmental grants to influence State-local choices. In particular, the Federal Government can provide a direct fiscal inducement to State and local officials to expand specific activities through a properly designed system of grants. The form of these grants is of central importance. For example[4] to encourage expansion of a particular service (like medical research) requires the use of a conditional grant, not simply an unconditional or lump-sum transfer of funds; that is, the funds must be earmarked for the intended purpose. But more than this, the grantor must ensure that the recipient is not in a position simply to substitute the grant monies for its own revenues such that there is no net effect on the level of the activity. Note that, even if a grant is conditional in the sense that the recipient is required to use the monies for a prescribed function or program, it does not follow that the grant will induce an increase in spending for the function relative to that which would have been forthcoming in the absence of the grant. For example, particularly in periods of rising budgets, a locality which receives a grant to expand local police services can use these funds to cover planned budgetary increments that would otherwise have been financed with its own revenues; the grant funds would then effectively be available for other programs or, alternatively, for local tax cuts. In short, this fungibility of grant funds may allow States and localities to use conditional grants in the same way that they would employ monies with no strings attached, thereby frustrating the intent of the Federal grant program.[4]

The proper form of grant in the presence of external benefits is a matching grant, under which the Federal Government agrees to pay some fraction of the unit cost of the recipient. Under 1:1 matching, for example, the State or locality receives $1 in grant monies for each $1 it expends from its own funds. Note that such a grant effectively cuts in half the cost of the prescribed State-local services to the State or locality. Moreover, the only way the recipient can increase its grant monies is by expanding its own spending. Unlike a block grant for some specified purpose, the matching grant has a "price effect" which provides a direct inducement to an expansion of the service. In theory, the matching terms should reflect the magnitude of the spillover effect; if, for example, $2 of local expenditure generate $1 of benefits for residents of other jurisdictions, then the Federal share should be one-third or 1:2 matching. This would effectively "internalize" the external benefits. In practice, it may be difficult to determine with any precision the exact shares of local and external benefits, but the analysis does at least provide some guidelines. It suggests that, where the purpose of the grant program is to en-

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[3] One attempt to compute some (admittedly rough) estimates of the welfare losses associated with imposing uniform levels of school expenditures across all jurisdictions generated some quite sizable magnitudes; the estimates indicated that, on average, the transfer of a dollar of spending from one school district to another involved a deadweight loss of about 50 cents (i.e., the expenditure of the additional dollar in the recipient jurisdiction was valued at 50 cents less than its loss in the school district where it was previously spent). See David Bradford and Wallace Oates, "Suburban Exploitation of Central Cities and Governmental Structure," in Harold Hochman and George Peterson, eds., "Redistribution Through Public Choice" (New York: Columbia University Press, 1974), pp. 43-90.

[4] For a more formal treatment of all this, see Wallace E. Oates, "Fiscal Federalism" (New York: Harcourt Brace Jovanovich, 1972), Chapter 3. A case in which this is not true is where the state or locality would have expended none of its own funds (or at least less than the sum of the grant) on the grant-aided program. So called demonstration grants may thus induce expenditures which would not have taken place without Federal assistance.

courage state and local provision of particular services that confer benefits elsewhere in the Nation, the appropriate instrument is the matching grant.[5] Moreover, where the spillover benefits are regarded as large compared to local benefits, the Federal Government should offer relatively benerous matching terms (and conversely).

B. Equalization of Fiscal Capacity: A Role for Unconditional Grants

In addition to improved resource allocation, federal systems of government have typically placed an extensive reliance on intergovernmental grants for equity reasons. The basic rationale for these grants stems from perceived geographical inequities in fiscal well-being; those jurisdictions with relatively large tax bases and a population that requires comparatively little in the way of social services are in a position to provide adequate service levels with significantly lower tax rates than elsewhere. Central governments in dozens of countries have responded to these geographic fiscal differentials with equalizing grants whose objective is to remove, or at least to narrow, the differentials.[6] The stated purpose of the grants usually runs 'n terms of establishing a fiscal environment in which each jurisdiction (e.g., State or locality) can provide a 'satisfactory' level of key public services with a "fiscal effort" that is not discernibly greater than that in other jurisdictions. To achieve this goal, the central government typically bases the allocation of grant funds on the measured "need" and fiscal capacity of the decentralized units of government so that jurisdictions with populations requiring large public expenditures and with comparatively small tax bases receive proportionately larger sums.

Two points concerning equalizing grants are worthy of special emphasis. First, note that the proper grant form in this case is an unconditional (lump sum) grant. The intent of the grant is to equalize fiscal capability; it is not to stimulate public spending. From this perspective, it would be inappropriate to employ a matching grant which would effectively lower the marginal cost of services to each jurisdiction and thereby directly encourage increased expenditure. Fiscal equalization implies grants to jurisdictions that vary with need and fiscal capacity, but are invariant to the fiscal response of the recipient.

Second, while equalizing grants may serve to reduce fiscal differentials among jurisdictions, they are not an effective device for achieving the socially desired distribution of income among individuals. Although such grants will typically channel funds (on net) to poorer areas, they are very clumsy instruments for redistributive purposes. Most low income areas will have some wealthy residents and, likewise, high income jurisdictions usually contain some poor individuals so that transfers from rich to poor areas through the medium of equalizing grants are bound to have some perverse redistributive dimensions.

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[5] These grants, incidentally, should involve "open-end matching:" that is, the matching terms should be available to the recipient whatever level of spending is selected. If the matching shuts off at some level of State or local expenditure on the program, the grant no longer has a price effect and may become equivalent in its effects to a purely unconditional, lump-sum grant. The use of closed-end matching could be justified, in principle, if external benefits decline significantly at high program levels or, more pragmatically, in terms of a budget constraint on the grantor. But the general presumption is in favor of open-end matching grants. On this, see Oates, "Fiscal Federalism," Chapter 3.

[6] For a careful examination of equalizing grants and their use in federal countries, see Russell L. Mathews, "Fiscal Equalization in a Federal System" (Canberra: Centre for Research in Federal Financial Relations, 1974).

Unconditional equalizing grants are not a substitute for a national program to achieve an equitable distribution of income among individuals.

C. Taxation and Revenue Sharing

A third important rationale for intergovernmental grants is the establishment of an efficient and fair system of taxation for the public sector as a whole. There exists the sense, backed by some evidence, that the Federal tax system is on net a more just and less distorting structure than the tax system of State and local governments. The Federal income tax, for example, is probably a good deal more progressive in terms of its incidence than State-local income, sales, and property taxes.[7]

Moreover, taxes at more decentralized levels of government have greater potential for distorting the flow of resources in the economy. To take one example, the supply of capital to the economy as a whole may not be very responsive to moderate levels of Federal taxation. At State and local levels, however, similar taxes may chase capital from high-tax to low-tax jurisdictions resulting in real inefficiencies in resource allocation and consequent reduced output. The relatively high mobility of both goods and people across State or local boundaries suggests much more sensitivity to fiscal differentials than at the national level (a sensitivity which State and local officials are well aware of).

In addition, with a little ingenuity, States and localities are often able to shift a substantial portion of their tax burden onto residents of other jurisdictions. The taxation of certain production activities in one jurisdiction, for instance, may result in higher prices that are paid largely by outsiders. As one illustration, the burden of value-added taxation of the auto industry by the State of Michigan probably falls predominately on purchasers of new automobiles throughout the Nation. Likewise, areas which draw heavy tourist populations frequently meet much of their local tax needs through substantial excise taxes on hotel and restaurant bills. These are not, incidentally, isolated examples: Charles McLure has estimated that, on average, State governments in the United States are able to "export" approximately 20 to 25 percent of their taxes onto residents of other States.[8]

The thrust of the argument is that it is considerably more difficult to design an efficient and equitable tax system at the State-local level than at the Federal level. People and goods can move away from high-tax jurisdictions and thereby introduce both serious distortions in the allocation of resources and unintended distributional results. The Federal government, in contrast, has a greater scope for reliance on progressive taxation and can avoid, through a national uniformity of tax rates, the distortions in resource allocation generated by State-local tax differentials. Moreover, a greater reliance on centralized taxation can also provide some economies of scale in tax administration. Data for the United States indicate that the administrative costs of

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[7] For a good summary of the evidence on the incidence of various taxes in the United States, see Joseph A Pechman and Benjamin A. Okner, "Who Bears the Tax Burden?" (Washington, D.C.: The Brookings Institution, 1974). As Pechman and Okner make clear, any conclusions on overall tax incidence must be hedged by a number of important qualifications.

[8] C. McLure, "The Interstate Exporting of State and Local Taxes: Estimates for 1962," "National Tax Journal," 23 (1970), pp. 206-213.

the Federal individual income tax amount to only about one-half of one-percent of revenues; at the State level, these costs for income or sales taxation are typically on the order of 1 to 2 percent of revenues.[9]

This suggests that we might improve the equity and efficiency characteristics of the Federal-State-local tax system as a whole by shifting more of the taxation function onto the central government. At the same time, however, we have stressed that there are important reasons for retaining State and local discretion over the size and composition of their expenditures. One way to accomplish these two objectives is through revenue sharing. From this perspective, revenue sharing is a mechanism through which Federal taxation can be substituted for State-local taxes. The Federal Government acts, to some extent, as a tax-collection agent for the States and localities: it collects tax revenues in excess of its own needs and distributes this excess in lump-sum form to State and local treasuries. Note that the appropriate form for these grants is as unconditional monies. It is of the greatest importance that State and local jurisdictions pay their own way at the margin; to promote fiscally responsible choices, it is essential that each jurisdiction bears the cost of any decisions to expand levels of State or local services.

We thus have two potential roles for unconditional grants: Fiscal equalization and an improved overall system of taxation. At a pragmatic level, there is no reason why the Federal Government cannot pursue both of these objectives at the same time through a system of unconditional grants (revenue sharing) in which the size of the per capita grant varies with the fiscal characteristics of the jurisdiction.

THE GROWING RELIANCE ON INTERGOVERNMENTAL TRANSFERS

The continuing growth in the size and complexity of the public sector has brought with it a rapid expansion in the use of intergovernmental grants. Such transfers provide a policy tool capable of promoting a number of quite different and important government objectives, and this has not gone unnoticed. Table 1 provides some aggregate data that document this striking growth: Federal grants to State and local governments have increased from about $2.5 billion in 1950 to almost $63 billion in 1978. This represents an annual compound rate of expansion of 12.7 percent, which is well in excess of the rate of growth of Federal outlays so that these grants have come to account for an increasingly large percentage of Federal spending. About 15 percent of Federal expenditures now take the form of grants-in-aid to States and localities.[10] On the receiving end, table 1 indicates that

[9] Joseph Pechman, "Federal Tax Policy," Revised Edition (Washington, D.C.: Brookings Institution, 1971), p. 53; James Maxwell, "Financing State and Local Governments," Revised Edition (Washington, D.C.: Brookings Institution, 1969), p. 102.

[10] This rapid expansion in intergovernmental transfers is not limited to the United States; it has happened in most other federal (and nonfederal) countries as well. In a comparative study of fiscal systems, Werner W. Pommerehne found over the period 1950–70 quite large increases in central-government transfers to other governments in Canada, France, West Germany, Switzerland, and the United Kingdom. See his, "Quantitiative Aspects of Federalism: A Study of Six Countries," in W. E. Oates, editor, "The Political Economy of Fiscal Federalism" (Lexington, Mass.: Heath-Lexington, 1977), pp. 336–337.

State governments have come to rely more substantially on Federal assistance; States now obtain close to one-fourth of their revenues from Federal grants.

TABLE 1.—GROWTH IN INTERGOVERNMENTAL GRANTS IN THE UNITED STATES

[Dollar amounts in millions for selected fiscal years]

	Federal grants-in-aid to State and local governments	Federal grants as a percentage of total Federal outlays [1]	Federal grants to States as a percentage of total State revenues	State aid to local government [2]	Federal grants directly to local government	Grants received by local government as a percentage of total local revenues [3]
	(1)	(2)	(3)	(4)	(5)	(6)
1950	$2,486	5.8	16.4	$4,217	$211	27.5
1960	6,974	7.6	19.4	9,522	592	27.2
1965	11,029	9.3	20.2	14,010	1,155	28.4
1970	21,857	11.1	21.6	26,920	2,605	33.1
1971	26,146	12.4	23.4	31,081	3,391	34.1
1972	31,253	13.5	23.8	35,143	4,551	34.0
1973	39,256	15.9	24.2	39,963	7,903	37.1
1974	41,820	15.5	22.5	44,553	10,199	38.2
1975	47,054	14.4	23.4	51,068	10,906	38.8
1976	55,589	15.2	22.7	56,169	13,576	39.1
1977	62,575	15.2	22.5	60,311	16,637	39.2

[1] Total Federal outlays as measured under the Unified Budget.
[2] State aid includes substantial amounts of Federal aid that is channeled through State governments to localities.
[3] Grant revenues include payments from both the Federal and State governments.

Sources: The data (either presented directly or used to calculate percentages) for years prior to 1976 are from Tax Foundation, Inc., "Facts and Figures on Government Finance," 19th biennial edition, 1977 (New York, 1977), tables 57, 110, 134, 147, 185; for 1976 and 1977, data are from Bureau of the Census, "Governmental Finances in 1975–76," table 5, and "Governmental Finances in 1976–77," table 5.

Likewise, local governments, which receive aid both from Federal grants and from their respective States, have become increasingly reliant on intergovernmental transfers. Table 1 indicates that in the aggregate State grants to local governments have risen from about $4 billion in 1950 to over $60 billion in 1977; similarly, Federal grants directly to local jurisdictions have grown rapidly from less than $1 billion in 1950 to over $16 billion in 1977. The relative size of the Federal and State contributions to the localities is, incidentally, a little misleading; several grant programs channel funds from the Federal Government to localities through the States, and these monies appear in official figures as State grants to local government. Regardless of the specific source, local governments now depend on intergovernmental grants for almost 40 percent of their total revenues.

Moreover, these transfers support a wide variety of public programs. Table 2 indicates the breakdown of Federal grants by categories of aid for fiscal year 1977. Note, in particular, the diversity of purposes for grant funds. A substantial chunk (about one-fourth) of Federal intergovernmental transfers goes for public welfare. There is a sound rationale for this. It is difficult for States and especially localities to engage in aggressive redistributive programs to help lower-income households. A particular jurisdiction that adopts high taxes on the wealthy with comparatively generous support for the poor creates a powerful set of incentives for migration that will encourage an influx of low-income beneficiaries and an outflow of the well-to-do. Such potential mobility across State and local borders constitutes a real constraint on the scope for redistributive fiscal activity at decentralized levels of government. This suggests that the Federal Government must assume a primary responsibility for public redistributive programs; the Federal Government has, in fact, used intergovernmental transfers extensively for this purpose.

TABLE 2.—*Federal Intergovernmental Expenditure,*[1] *1976–77*

	Millions
Education	$10, 205
Grants-in-aid	8, 339
Elementary and secondary education	2, 302
School lunch and school milk program	2, 144
Human development	1, 564
Maintenance and operation of schools	696
Occupational, vocational, and adult education	660
Emergency school assistance	238
Education for the handicapped	118
Work incentive training	99
Other grants-in-aid	518
Payments for services	1, 866
Scientific research and development	1, 840
Tuition payments	26
Public welfare	19, 520
Medical assistance (medicaid)	9, 829
Maintenance assistance	6, 337
Social services, N.E.C.[2]	2, 405
Special supplemental food programs (WIC)	279
Food stamp program	250
Work incentives, N.E.C.[2]	242
Other	178
Health and hospitals	2, 353
Health services administration	720
Alcohol, Drug Abuse, and Mental Health Administration	471
Health Resources Administration, N.E.C[2]	410
National Institutes of Health	294
Environmental Pollution Abatement and Control	191
Other	267
General revenue sharing	6, 764
Highways	6, 173
Natural resources	969
Housing and urban renewal	2, 914
Air transportation	381
Social Insurance Administration	1, 532
Other and combined	22, 238
Unemployment compensation for Federal Employees, ex-servicemen, and temporary extended benefits	5, 213
Labor and manpower, N.E.C.[2]	4, 747
Waste treatment facilities	4, 052
Community planning and development	2, 207
Urban mass transportation	1, 891
Antirecession fiscal assistance	1, 694
Law Enforcement Assistance Administration	684
Civil Defense and Disaster Relief	287
Federal contribution to District of Columbia	281
Programs for the Aging	203
Promotion of science, research, libraries and museums	177
Payments in lieu of taxes	168
Other	634
Total Federal intergovernmental expenditure	73, 045

[1] Federal intergovernmental expenditure includes, in addition to pure grants, Federal payments for certain services from State and local government so that the total of these expenditures exceeds somewhat the figure for Federal grants-in-aid for fiscal year 1977 that appears in Table 1.

[2] N.E.C. means "Not Elsewhere Classified."

Source: Bureau of the Census, "Governmental Finances in 1976–77", Tables 10 and 12.

We noted earlier the role for these transfers to provide a stimulus for State-local programs that confer benefits on residents of other areas. Federal grants for highways and for various educational activities are good examples of grants for this purpose: the U.S. population as a whole has an important interest both in a good system of national roadways and in an educated electorate. Intergovernmental grants provide a mechanism for higher level governments to represent the broader concern through budgetary incentives.

In addition, the Federal Government instituted in 1972 a system of revenue sharing with State and local governments. Although the revenue-sharing formulae are quite complex, the program amounts roughly to a set of unconditional grants to the States and localities on a per capita basis.[11] Over the longer run as indicated earlier, revenue sharing is essentially a substitution of Federal taxation for State-local revenues with the objective of an improvement of the efficiency and equity characteristics of the overall tax structure.

Aside from revenue sharing, the Federal Government in the United States (in contrast to many other countries) has relied almost exclusively on conditional grants. These grants usually involve some kind of cost sharing between the Federal agency and the recipient State or locality, which typically takes one of two forms: An explicit grant formula that specifies the respective shares of the grantor and recipient or an application and negotiation procedure for a particular "project grant" under which the State or local share is determined in the grant process itself. In both instances, the Federal Government has typically included equalizing elements by providing more generous matching terms to jurisdictions with a lesser fiscal capacity. This is accomplished under grant formulae through "variable matching grants" in which the fiscal circumstances of the jurisdictions enter into the formula that determines the Federal matching share; under project grants the Federal administrator takes local fiscal capacity into consideration in determining the local contribution.[12] Formula grants, incidentally, are the major grant instrument in the Federal intergovernmental transfer system: one study found that formula grants account for about two-thirds of the dollar total of Federal grants to State and local governments; formula grants, moreover, go primarily to the States. In contrast, the Federal Government has employed project grants mainly for transfers to local governments; project grants make up about one-fifth of the dollar total of Federal intergovernmental transfers.[13]

This brief overview suggests that economic analysis can go some distance in providing a rationale for the Federal grant system. However, the discussion to this point has been in highly aggregative terms; closer examination of Federal transfers to State and local governments reveals a number of anomalies. This should not be surprising, for the design and enactment of grant programs is, in

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[11] Revenue sharing does have some modest equalizing features. For a careful analysis of the formulae, see Robert Reischauer, "General Revenue Sharing: The Program's Incentives," in W. E. Oates, editor, "Financing the New Federalism" (Baltimore: Johns Hopkins University Press for Resources for the Future, 1975), pp. 40–87.

[12] For an excellent analysis of how project grants work, see Howard Chernick, "The Economics of Bureaucratic Behavior: An Application to the Allocation of Federal Project Grants," in Peter Mieszkowski and William Oakland, editors, "Fiscal Federalism and Grants-in-Aid" (Washington, D.C.: Urban Institute, 1979), pp. 81–103.

[13] See Advisory Commission on Intergovernmental Relations, "Federal Grants: Their Effects on State-Local Expenditures, Employment Levels, Wage Rates" (Washington, D.C.: ACIR, Feb. 1977, A-61). This study uses data for 1972.

part, the result of an interaction of Governors, mayors, and various special interest groups with Federal legislators. Such interaction is frequently characterized by a tension between the grant administrator's desire to restrict the scope for use of funds to realize the grantor's objectives and the recipient's efforts to minimize any strings attached to the monies. The form of the grant program that finally emerges must reflect, to some extent, the nature of the resulting compromise.

With this in mind, it is interesting to return at least briefly to the structure of the Federal grant system and explore a bit further the extent to which this structure appears consistent with our economic principles of grant design. We have noted as a primary justification for intergovernmental grants the existence of external benefits across governmental jurisdictions for a range of State-local services including such things as highways and educational programs. For such programs, the analysis prescribes a system of open-ended matching grants where the respective matching shares reflect (at least roughly) the extent of the spillover benefits. From this perspective, certain characteristics of the Federal grant system are quite puzzling. Most Federal matching grants are close-ended—with the major exceptions being Federal grants for public assistance and Medicaid.

This implies that, at the margin, the States and localities that have reached maximum funding are receiving no inducement to take into account the spillover benefits that their fiscal decisions generate. Moreover, it appears difficult to justify the actual matching shares under a number of programs by the extent of external benefits. The Federal share, for example, for interstate highways has been 90 percent of construction costs; it seems unlikely that 90 percent of the value of the interstate highways passing through a particular State would accrue to out-of-State drivers. To an even greater degree, the benefits from sewage waste-treatment systems are largely local; there may exist in some instances, significant external effects involving neighboring jurisdictions, but hardly enough to rationalize the existing Federal share of 75 percent of construction costs. More generally, a study by the Advisory Commission on Intergovernmental Relations reveals that most Federal grant programs require either low (less than 50 percent) or no matching on the part of the recipient State or local government; programs requiring high matching (over 50 percent from the recipient) appear to account for only about 5 percent of Federal grant monies.[14] It seems likely that for many programs external benefits themselves are inadequate to justify the magnitude of the Federal share.[15]

The tendency over the past decades has been toward the consolidation of specific programs into larger block grants to the States and localities with the funds distributed by formula. This movement to

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[14] ACIR, "Federal Grants," pp. 26–28.

[15] In addition to the issue of the matching share itself, other elements in grant design can have a profound impact upon the effectiveness of a particular grant program. As one illustration, we return to the Federal subsidy program for waste-treatment plants to reduce water pollution, under which the Federal Government has provided several billion dollars for the construction of new waste-treatment facilities. As various studies have shown, the failure to link the grants directly to their intended purpose—the reduction of water pollution—has seriously undercut their efficacy. In particular, the subsidies support only a specific technology—waste treatment—even where a less costly and more effective alternative exists. Moreover, by subsidizing only the construction of treatment plants, the program has provided no incentive for the efficient operation of these facilities; one study found that in over half the plants studied services were substandard either because of poor operating procedures or because the plants were not designed to treat the waste load delivered to them. On this, see Allen V. Kneese and Charles L. Schultze, "Pollution, Prices, and Public Policy" (Washington, D.C.: The Brookings Institution, 1975), Chapter 3.

grant consolidation has much appeal. In particular, it has simplified the Federal grant system somewhat by replacing a maze of sometimes overlapping and conflicting individual programs with a single grant of funds to support a fairly wide range of State and local services. In this way, such block grants permit the recipient much greater discretion in the use of the monies so that State and local officials can allocate their available resources more closely in line with thier own priorities. At the same time, it must be recognized that block grants provide virtually no economic incentives for uses of funds for particular services or functions. Since they entail no open-ended matching requirements, these grants do not affect the marginal costs of providing public services to the respective State or locality. As we stressed earlier, the fundibility of grant funds makes conditional block grants, in principle, equivalent to purely unconditional transfers of funds. For this reason, they are not a suitable policy instrument for resolving distortions in the provision of public services associated with external benefits or costs.

In the evaluation of Federal grant programs, it is essential (in addition to observing general principles) to measure the impact of the programs on the decisions, budgetary and otherwise, of State and local officials. There has been some effort in this direction, although our understanding of the effects of Federal grants is, at best, quite spotty. Despite the considerable variation in the particular estimates from one study to the next, research findings, on the whole, suggest that Federal grants have had a substantial stimulative impact on State and local expenditures; grant monies have not been used simply to substitute for State-local tax revenues.[16] Moreover, the evidence supports our expectation that conditional grants generate a larger expenditure response (dollar-for-dollar) than do purely unconditional transfers, with high Federal matching providing a greater stimulus than low matching.

While these general results are consistent with our theoretical expectations, there is another aspect of the findings that is somewhat more intriguing: The extent of budgetary expansion appears, in some instances, to be surprisingly large. Consider, for example, the case of a purely unconditional grant to a local community. Since such grants contain no explicit incentives for budgetary expansion, we might expect the members of the community to treat these monies as a kind of windfall supplement to their wealth or income. In principle, it shouldn't really matter that the monies flow into the local government treasury; if local officials are responsive to the preferences of their constituencies, it should make little difference whether the grant goes to the local government or directly into the pockets of the local residents. In short, it seems reasonable to expect the effect of an unconditional intergovernmental grant to be (at least roughly) equivalent to a set of unconditional grants to the people themselves. From this perspective, an unconditional intergovernmental grant is simply a veil for a Federal tax cut directly to individuals.[17]

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[16] For useful surveys of the empirical work on the budgetary impact of intergovernmental grants, see Edward M. Gramlish, "Intergovernmental Grants: A Review of the Empirical Literature," in W. Oates, education, "The Political Economy of Fiscal Federalism" (Lexington, Mass.: Heath-Lexington, 1977), pp. 219–240; and ACIR, Federal Grants."

[17] For a formal presentation of the veil hypothesis, see David F. Bradford and Wallace E. Oates, "The Analysis of Revenue Sharing in a New Approach to Collective Fiscal Decisions," "Quarterly Journal of Economics," 85 (August, 1971), pp. 416–439.

The implication of the "veil hypothesis" is that the additional local public spending generated by a dollar of lump-sum grants to the local government should be approximately the same as the incremental public expenditure resulting from a one-dollar increase in private income in the jurisdiction. In both cases, aggregate income in the jurisdiction has risen by a dollar so that the desired increase in public spending should be (roughly) the same. However, existing empirical work suggests that this is not the case. In particular, if the present size of the State-local sector is any guide to desired marginal adjustments, one might look for increases in private income to induce additional State-local expenditure on the order of 10 to 15 cents per dollar of additional income. The evidence indicates, however, that the stimulative effect of unconditional intergovernmental transfers is much larger than this—closer to a figure of 50 cents on the dollar. Lump-sum Federal grants to the States and localities do not appear to be equivalent in their budgetary effects to a cut in Federal income taxes.[18]

Although our understanding of the workings of intergovernmental grants is far from complete, economic analysis does provide a number of important insights. In particular, the discussion indicates that the Federal Government has found these grants an attractive policy tool for the pursuit of a diverse set of objectives: The encouragement of State-local programs which also service the broader national interest, the promotion of an improved distribution of income, and the establishment of a more efficient and equitable tax system. However, to accomplish their intended objectives at the least cost to society as a whole, individual grant programs must take the proper form; they must provide the appropriate incentives for State and local decision-makers. It is clear that, from this perspective, a number of Federal grant programs have serious deficiencies. The careful application of our principles of grant design together with evidence of the response to particular types of fiscal incentives can make a valuable contribution to the removal of these deficiencies and to the evolution of a structure of intergovernmental transfers that effectively promotes our allocational and distributional objectives.

More recently, the Federal Government has expressed interest in the potential of intergovernmental grants as a macro-stabilization tool. This issue, to which we next turn, is a central concern of this paper.

II. Intergovernmental Grants for Countercyclical Purposes

The "Economic Stimulus Package of 1977" (consisting of Anti-Recession Fiscal Assistance, local public works, and public service employment under titles II and VI of the Comprehensive Employment and Training Act) represents the culmination of recent interest in the United States in intergovernmental grants as a device for assisting in the maintenance of the economy at high levels of employment with reasonable stability of prices. This set of programs provides

[18] The evidence on the apparently large stimulative impact of unconditional grants comes from a number of sources including various econometric studies and an actual monitoring of the U.S. revenue sharing program. There are, however, important qualifications attached to these results such that they should not be regarded by any means as the last word on the subject. For descriptions of these findings, see E. Gramlich, "Intergovernmental Grants: A Review . . . ," and Richard P. Nathan, Charles F. Adams, Jr., and Associates, "Revenue Sharing: The Second Round" (Washington, D.C.: The Brookings Institution, 1977). For a useful collection of papers exploring this whole issue, see Peter Mieszkowski and William Oakland, editors, "Fiscal Federalism and Grants-in-Aid" (Washington, D.C.: Urban Institute, forthcoming).

a variety of Federal assistance to State and local governments including supplementary revenue-sharing funds in times of recession and grant monies specifically earmarked for local public works or public service employment. In each instance, the magnitude of the grant funds is tied explicitly to the state of the economy (both national and local).

Proposals for countercyclical intergovernmental assistance in the United States have a considerable history, which is both interesting and instructive in its own right. In the 1940's Alvin Hansen and Harvey Perloff argued that State and local fiscal activity had been (and, in the absence of major reform could be expected to be) highly destablizing.[19] Looking back over the preceding decades of the 1920's and 1930's, they called attention to the perverse fiscal behavior of State and local governments:

> The taxing, borrowing, and spending activities of the State and local governments collectively have typically run counter to an economically sound fiscal policy. These governmental units have usually followed the swings of the business cycle, from crest to trough, spending and building in prosperity periods and contracting their activities during depression. In the boom of the late twenties, they added to the disposable income of the community, and bid up prices and building costs in large-scale construction activities. In the depressed thirties, the fiscal policies of these governments exerted a deflationary rather than an expansionary effect on the economy: expenditures, and especially construction outlays, were severely reduced, borrowing was restricted, and taxes weighing on consumption were substantially increased.[20]

Their explanation of this behavior is a straightforward and, on the surface at least, a fairly compelling one. Most State and local governments operate subject to some sort of legally required balanced budget (for current expenses). When the national economy goes into recession, their tax revenues level off or even decline. The balanced-budget constraint then forces State and local officials to cut spending and/or raise tax rates to eliminate the potential deficit. In consequence, State and local fiscal activity accentuates the swings in the level of economic activity.

This view of State-local budgetary behavior has become known as the "fiscal-perversity" hypothesis. To deal with the problem, Hansen and Perloff suggested some budgetary reforms which would allow State and local governments to build up financial reserves in good times that could be drawn upon to maintain spending in times of recession. In addition, they explicitly recommended that the Federal Government initiate special grants to the states and localities for expanded public construction programs during recessionary periods because "Only the Federal Government is in a position to manage adequately the interrelated problems involved in carrying out a positive and flexible countercyclical policy." [21] They reasoned that, since there typically exists considerable flexibility in the timing of construction projects, it would make sense to use this flexibility for countercyclical purposes by encouraging more capital spending when slack exists in the economy. This would be accomplished by making special Federal grant funds available at such times to State and local governments.

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[19] Alvin H. Hansen and Harvey S. Perloff, "State and Local Finance in the National Economy" (New York: Norton, 1944), ch. 4.
[20] *Ibid.*, p. 49.
[21] *Ibid.*, p. 199.

What the discussion makes clear is that the case for the Hansen-Perloff proposal (and, likewise, for current measures for countercyclical fiscal assistance) depends on two distinct premises:

(1) State and local governments tend to behave in a fiscally destabilizing fashion over the course of the business cycle; and

(2) Federal grants to State and local governments that vary inversely with the level of aggregate economic activity in the economy can, to some significant degree, reverse or at least neutralize this perverse pattern of behavior.

Both of these premises are empirical propositions on which we have some evidence both in terms of U.S. experience and that in other federal countries as well. A careful consideration of this evidence should tell us a good deal about the potential effectiveness of intergovernmental grants as a countercyclical policy tool.

A. Cyclical Budgetary Behavior of State-Local Governments

One must first examine the historical record of State-local fiscal activity to see if it supports the fiscal perversity hypothesis. Have State and local governments in fact followed a destabilizing course of fiscal behavior?

Robert Rafuse undertook the first careful study of this issue in an examination of the post World War II period.[22] Exploring the period from 1946 to 1964, Rafuse found that State and local budgetary behavior was dominated by one feature: Continued and dramatic growth regardless of the condition of the national economy. State-local spending and taxes increased steadily through periods of boom and recession alike. From the perspective of the downswing, this was most encouraging. Rafuse concludes that "These [State and local] governments have been a significant factor in moderating the seriousness of the postwar recessions and in promoting recovery." [23] In particular his estimates indicate that, in the aggregate, State-local fiscal behavior reduced the magnitude of the contraction in the economy in every one of the four postwar recessions he examined. In the 1960–61 downswing, for example, Rafuse estimates that the decline in GNP of $2.7 billion from the second quarter of 1960 to the first quarter of 1961 would have been in excess of $6 billion in the absence of the stabilizing fiscal influence of the State-local sector.

Of course, the obverse of this is that continuing State-local budgetary expansion did contribute to the overheating of the economy during periods of excess demand. However, the record for the two decades following the conclusion of World War II does not appear consistent with the fiscal-perversity hypothesis; State and local governments were not over these years a systematically destabilizing force in the economy.

Before looking at the more recent record, it may prove useful at this juncture to stop and ask where (assuming the Rafuse findings to be correct) Hansen and Perloff might have gone wrong. Three points are particularly relevant:

(1) The automatic response of State-local budgets to cyclical movements in the economy tends, on balance, to be stabilizing. As the

[22] "Cyclical Behavior of State-Local Finances," in Richard A. Musgrave, ed., "Essays in Fiscal Federalism" (Washington, D.C.: The Brookings Institution, 1965), pp. 63–121.
[23] *Ibid.*, p. 118.

economy contracts, for example, tax receipts tend to decline thereby cushioning the fall in consumers' disposable incomes. At the same time, certain expenditures including those associated with unemployment benefits are on the rise which further shores up private purchasing power.

(2) If State and local fiscal behavior is to be destabilizing (on net), the source must be in the discretionary response of public officials to the changing state of the economy. In particular, the fiscal-perversity hypothesis posits a response of increased tax rates and decreased discretionary expenditures to the potential budgetary deficit created by the contraction in the economy. Such a discretionary response may occur, but it need not. If State and local officials have adequate financial reserves, they may simply ride out difficult times by drawing on these reserves without raising taxes or cutting spending; the reserves can then be replenished during the succeeding expansion. It is not clear a priori which view closely approximates actual budgetary patterns, but it does suggest that a close examination of the cyclical behavior of State and local holdings of financial assets should provide some useful evidence. Note, moreover, that even if there is some "perverse" discretionary response of the Hansen-Perloff variety it must more than offset the automatic features of State-local fiscal systems to render the overall effect destabilizing.

(3) Most of the preceding discussion focuses on operating budgets. However, a major category of State and local expenditure which is not heavily dependent on current revenues is new construction. The bulk of capital spending by States and localities is financed by the issue of long-term debt. There is a sound rationale for this form of finance: since capital structures provide services to the various (and changing) residents of a jurisdiction over a long period, it makes sense to spread out the payments for these services over the useful life of the facility, rather than to place the whole burden on current residents through tax finance.

More recent State-local fiscal experience provides some useful evidence on all this. In particular, the Advisory Commission on Intergovernmental Relations (ACIR) published in 1978 its findings on the cyclical patterns of State-local budgets.[24] Using a number of different measures of fiscal activity, the ACIR study examines State-local spending and revenues over the four upswings and contractions in the U.S. economy from 1958 to 1977. The ACIR findings reinforce the Rafuse conclusions. Table 3 summarizes these results for rates of growth of expenditures, revenues, and surpluses. Note that, in each of the four contractions, State-local spending grew more rapidly than revenues so that, in the aggregate, the change in the surplus was negative. Conversely, during expansions, receipts grew faster than expenditures thereby pushing State-local budgets in the direction of a larger surplus. Like Rafuse, the ACIR found that the State-local sector has exerted, on net, a stabilizing influence on the national economy.

[24] "Countercyclical Aid and Economic Stabilization" (Washington, D.C.: U.S.G.P.O., December 1978).

TABLE 3.—STATE-LOCAL FISCAL BEHAVIOR: AVERAGE QUARTERLY RATES OF GROWTH OF EXPENDITURES, RECEIPTS, AND SURPLUSES, 1957–77

	Average quarterly rate of growth in percent		
	Expenditures [1]	Receipts	Surplus (average quarterly change, billions)
DURING RECESSIONS			
Contraction [2] (peak-trough):			
1957: III–1958: I	2.9	1.7	−$0.55
1960: I–1960: IV	2.1	1.9	−.10
1969: III–1970: IV	3.2	2.8	−.46
1973: IV–1975: I	3.3	2.6	−1.32
DURING EXPANSIONS			
Expansion [2] (trough-peak):			
1958: I–1960: I	1.5	2.4	.34
1960: IV–1969: III	2.4	2.5	.08
1970: IV–1973: IV	2.5	2.9	.80
1975: I–1977: I	1.8	2.9	2.95

[1] Total expenditures, receipts, and surplus were used to compute the above, hence Federal aid and trust fund amounts are included.

[2] Peak and trough quarters used are for real GNP, as identified by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA).

Source: Advisory Commission on Intergovernmental Relations, "Countercyclical Aid and Economic Stabilization (Washington, D.C.: U.S.G.P.O., December 1978), p. 6.

In addition to these summary measures of fiscal activity, Edward M. Gramlich of the University of Michigan conducted a careful econometric investigation of State-local budgetary behavior.[25] Gramlich constructed a comprehensive model of State-local budgetary activity in which fiscal officials maximize an objective function subject to a set of budgetary constraints. The distinguishing feature of the model is its focus on asset stocks (including both physical capital and financial assets) as key decision variables. Gramlich used quarterly data from 1954 through 1977 to estimate the parameters of the model. What emerges from this study is a view of State-local fiscal behavior that contrasts sharply with the Hansen-Perloff perspective. In particular, Gramlich finds that changes in the stock of financial assets absorb the lion's share of cyclical movements in the budget. Using the estimated model in a simulation exercise to evaluate the impact of the 1975 recession on the State-local sector, he finds that the recession induced only a quite small reduction in spending; although tax receipts fell substantially, State-local officials apparently absorbed this reduction in the form of a smaller budgetary surplus. In short, the Gramlich results suggest that State and local governments are not prone to the destabilizing kind of fiscal behavior envisioned in the fiscal perversity hypothesis.

[25] See his "State and Local Budgets, the Day After It Rained: Why is the Surplus So High?," Brookings Papers on Economic Activity, 1 (1978), pp. 191–214; and "State and Local Budget Surpluses and the Effect of Federal Macroeconomic Policies," A Study for the Joint Economic Committee of the U.S. Congress (Washington, D.C.: U.S. Government Printing Office, January 12, 1979).

The Gramlich findings receive some additional support from another study of State-local fiscal activity by Frank Jones and Mark Weisler.[26] Looking at the 1970's, they find (as expected) a pronounced *automatic* countercyclical effect in State and local budgets; during years of rising unemployment, the state of the economy itself induced increased spending and held back growth in tax revenues to a significant extent. Predictably, the discretionary response in State-local budgets was typically (but not always) in the opposite direction, but for most years the automatic effects dominated so that, *on net*, State and local fiscal activity has been counter-rather than pro-cyclical.[27]

More generally, Jones and Weisler examine econometrically the financial behavior of State-local government from 1955 to 1976. Like Gramlich, they find that the accumulation of financial assets by State-local governments is inversely related to the state of the economy: during periods of rapidly rising real GNP, State and local officials build up financial stocks; during harder times, they draw on them (or borrow).[28] In short, the State-local sector relies on financial adjustments to absorb cyclical budgetary influences so as to insulate, to some degree at least, expenditure programs from cyclical forces.

In addition, the Jones and Weisler regression equations indicate that State and local capital spending is significantly countercyclical. From 1955 to 1976, State-local expenditures both on new structures and for durable equipment exhibited an inverse relationship with the percentage change in real GNP. This, as noted earlier, is really not too surprising: during periods of slack in the economy, credit is readily available on comparatively easy terms so that these are attractive times for State-local governments to issue long-term debt and initiate previously planned capital projects.

The picture that emerges from the evidence this paper draws together suggests that the State-local sector has not been a destabilizing force in the U.S. economy; if anything, it seems to have been moderately stabilizing. The record, therefore, does not appear to support Hansen and Perloff's fiscal-perversity hypothesis. It is interesting to recall that the Hansen-Perloff view drew largely on the fiscal behavior of State and local government in the Great Depression of the 1930's. During this extraordinary episode in U.S. economic history, the State-local sector contributed to the severity of the economic decline by raising taxes and cutting spending. The time pattern of this response however, is quite intriguing. Using E. Cary Brown's measures of a weighted full-employment surplus,[29] the data indicate that over the first four years of the Depression, State and local government actually behaved in a fiscally supportive manner in the sense of adding positively to the level of aggregate demand. It was only after 1934

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[26] "Cyclical Variations in State and Local Government Financial Behavior and Capital Expenditures," "Proceedings of the Seventieth Annual Conference on Taxation," National Tax Association—Tax Institute of America (Columbus, Ohio, 1978), pp. 78–87.

[27] There are, incidentally, some difficult conceptual and empirical problems in separating discretionary from automatic changes in the budget. Jones and Weisler use the conventional full-employment budget surplus as their benchmark for this distinction. For some reservations on all this, see Edward M. Gramlich, "Comments on Vogel's 'The Responsiveness of State and Local Receipts to Changes in Economic Activity: Extending the Concept of the Full Employment Budget,' " "Studies in Price Stability and Economic Growth, Papers Nos. 6 and 7, The Impact of Inflation on the Full Employment Budget," Joint Economic Committee, U.S. Congress (Washington, D.C.: U.S. Government Printing Office, June 30, 1975).

[28] Somewhat more precisely, their equations indicate that, on average, various categories of State-local borrowing are negatively related to the percentage change in real GNP; the *t*-statistics, however, are not sufficiently large to permit great confidence in these particular results.

[29] "Fiscal Policy in the 'Thirties:' A Reappraisal," "American Economic Review" 46 (December 1956), pp. 857–879.

that the State-local sector became a net drag on the economy. This suggests an interesting view: Over the course of the usual ups and downs in the economy, the State-local sector seems not to accentuate cyclical swings (and, if anything, to be modestly countercyclical); but over an *extended* period of major contraction, State and local governments, as they exhaust their normal reserves, will be forced to adopt restrictive budgetary measures to meet fiscal constraints. The implication appears to be that the State-local sector may need some sort of disaster insurance to prevent procyclical activity in cases of real economic collapse, but not continual support over the normal swings in the economy.

B. The Effects of Intergovernmental Grants on the Cyclical Pattern of State-Local Expenditure

The evidence from the United States does not support the first premise of the case for countercyclical fiscal assistance. But what about the second? What can one say about the likely impact of countercyclical grants on the temporal pattern of State-local expenditure? Even if the State-local sector has been a moderately stabilizing force in the economy, it is possible that anticyclical grants could make State and local government yet more stabilizing.

As far as the United States is concerned, there is little to go on because of the virtual absence of experience with such grants prior to the 1976–77 legislation. The one attempt to answer this question is Gramlich's simulations of his model of the State-local sector.[30]

In particular, Gramlich used his model to estimate the response in State and local expenditure to the three types of Federal aid included in the Economic Stimulus Program; these include essentially unconditional grants under Anti-Recession Fiscal Assistance, funding for capital projects under the local public works program, and monies for job creation under Titles II and VI of CETA. His estimates are quite striking: they suggest that, in the very short run, only a miniscule portion of any grant funds will find their way into increased expenditure *or* tax relief. In the case of countercyclical revenue sharing, for example, Gramlich finds that, in the first quarter following the grant, only 3 percent of the funds will go into increased spending and only 6 percent will be used for tax reduction. The remainder (over 90 percent) will be absorbed into increased financial stocks.

This is a particularly disturbing result. If, for example, State and local governments did not use countercyclical aid to increase their expenditures but instead cut State-local taxes, at least the additional grant funds would have effects roughly like a Federal tax cut; they would increase disposable income and stumulate, to some extent, private expenditure. If, however, the grant monies simply go into a larger State-local surplus, they will exert hardly any effect on the level of aggregate demand. The Congressional Budget Office, for one, has expressed concern over the likely effectiveness of countercyclical revenue sharing for just this reason.[31]

Note that these results do not imply that intergovernmental grants have only minor effects on State-local expenditure. As we say in

[30] See papers cited in footnote 25, especially the JEC paper.
[31] Congressional Budget Office, "Countercyclical Uses of Federal Grant Programs (Washington, D.C.: U.S. Government Printing Office, November 1978), p. 37.

Part I, a wide body of evidence suggests that these grants have quite sizable stimulative effects.[32] The issue here is one of timing. Gramlich's results indicate that the short-run effects are minimal; over the longer haul, as State-local financial stocks accumulate, more of the grant funds flow into increased spending and reduced State-local taxes. But, of course, it is the short run that is important for macrostabilization policy, and, from this perspective, Gramlich's estimates cast serious doubt on the countercyclical potential of intergovernmental grants in the United States. The time lag in the impact of these grants appears too long for stabilization purposes.

C. Fiscal Experience in Other Federal Countries

The impact of decentralized levels of government on the cyclical behavior of the economy has been a matter of serious concern in other federal nations. In each case, the central government has assumed a primary responsibility for macrostabilization policy, but the fear has been that central countercyclical measures will be offset, partially or totally, by destabilizing budgetary activity at decentralized levels such that the public sector as a whole will not achieve the desired fiscal stance over the course of the upswings and downswings in the level of aggregate economic activity. A survey of research and of actual policy in other federal countries may therefore provide further insights.

There has been some research in Canada on the issue of the actual pattern of provincial and municipal fiscal activity. In particular, Robinson and Courchene, looking at the period 1952–65, tried to determine if provincial and municipal budgetary movements had been pro- or anti-cyclical.[33] Their findings are not too different from those in the United States. In short, they find that provincial and municipal government, taken as a whole, has exerted a stabilizing effect on the Canadian economy. In a series of regression equations, they find that from 1952 to 1965 a rise in the unemployment rate (or, alternatively, a fall in the ratio of actual to potential GNP) reduced significantly the aggregate surplus in provincial-municipal budgets. Although the fiscal swings at the provincial-municipal level have not been as strongly countercyclical as those of the Federal budget, they have at least been in the right direction. The source of this fiscal behavior is interesting. Undertaking some disaggregation, Robinson and Courchene found that municipal budgetary activity has, on average, been essentially neutral with regard to cyclical movements in the economy; neither municipal revenues nor spending show much in the way of fiscal sensitivity to the state of the economy. In contrast, provincial revenues exhibit pronounced anti-cyclical swings with revenues declining in recession and rising in the upswing; the authors note some tendency for provincial spending to be procyclical, but this is more than offset by changes in revenues. In summary, the Robinson-Courchene study suggests that in Canada, as in the United States, the evidence does not provide much support for the fiscal-perversity hypothesis.

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[32] For a survey of the empirical work on the stimulative effects of intergovernmental grants, see Gramlich, "Intergovernmental Grants: A Review of the Empirical Literature," in W. Oates, editor, "The Political Economy of Fiscal Federalism" (Lexington, Mass.: Health-Lexington, 1977), pp. 219–240.

[33] T. R. Robinson and T. J. Courchene, "Fiscal Federalism and Economic Stability: An Examination of Multi-Level Public Finances in Canada, 1952-65," Canadian Journal of Economics, 2 (May 1969), pp. 165–189.

This finding receives further support from a more detailed study of the cyclical patterns of budgetary activity in a single province; Douglas Auld, using a weighted-budget measure to examine the fiscal record of the Ontario provincial government found, on the whole, a stabilizing pattern of budgetary response to the state of the economy;[34] there was ". . . little evidence of a consistent 'perverse' effect."[35]

In contrast to the Canadian experience, there is some evidence of destabilizing fiscal behavior by State and local governments in the Federal Republic of Germany.[36] Moreover, and this is of particular interest here, the Federal Government in West Germany has attempted to modify this behavior through the use of both tied and unconditional grants to the States. The effects of these programs may shed some further light on the potential of intergovernmental grants for macrostabilization purposes.

Concern developed over the 1960's in West Germany with the observed procyclical character of State and local capital spending (which accounts for over three-fourths of total public investment); local investment expenditures in particular grew rapidly in booms and declined considerably in recessions thereby accentuating cyclical forces in the economy. The Federal Government, however, is constitutionally prohibited from giving aid directly to local governments; all such monies must go through the States. Inasmuch as grant funds themselves had exhibited a slightly procyclical pattern (since they were tied to tax revenues), an explicit attempt was made in the 1966–67 recession to supplement the usual grant flows; in particular, the Federal Government expanded its tied grants to the States for local investment programs by 23½ percent. State grants to local governments, however, increased by only about 2 percent. For one major program, public provision of low-cost housing, the Federal Government increased its grants to the States from 250 million DM in 1966 to 1,560 million DM in 1967; the response of the States was to reduce their own contributions for this program from 3,890 million DM to 2,510 million DM. In short, the States reduced their expenditure "mark-for-mark" with the increase in monies from the Federal Government. Total public expenditure for the program actually declined from 1966 to 1967!

More generally, Jack Knott examined the grant receipts and investment expenditures for each of the eight regular States from 1966 to 1971.[37] The results are quite suggestive. In four of the States, investment grants to local governments exhibited a pronounced procyclical pattern: they declined absolutely during the 1966–67 recession and then expanded rapidly during the 1969–71 boom at about a 20 percent annual rate. In contrast, the other four States pursued a more countercyclical course; in these States grants grew rapidly (at an annual rate

[34] Douglas A. L. Auld, "Counter-Cyclical Budget Effects in Ontario: Some Preliminary Evidence," Canadian Tax Journal (March–April, 1975), pp. 173–183.
[35] *Ibid.*, p. 181.
[36] On the Germany experience, see Jack H. Knott, "Stabilization Policy, Grants-in-Aid, and the Federal System in Western Germany," in W. E. Oates, editor, "The Political Economy of Fiscal Federalism" (Lexington, Mass.: Heath-Lexington, 1977), pp. 75–92; Knott, "Accommodating Purposes: Fiscal and Budgetary Policy in West Germany" (Berlin: International Institute of Management, April 1978); P. Bernd Spahn, editor, "Principles of Federal Policy Coordination in the Federal Republic of Germany: Basic Issues and Annotated Legislation" (Canberra: Centre for Research on Federal Financial Relations, The Australian National University, 1978).
[37] "Stabilization Policy, . . . ," pp. 82–87.

of roughly 15 percent) during the recession and then slowed their rate of growth in the subsequent period of economic expansion. When, however, Knott looked at local public investment expenditures in these groups of states, he found only modest differences. For both groups, local investment spending was procyclical: expenditures fell absolutely in the recession and rose significantly in the boom. Despite the quite striking differences in State grant policy with four States adopting procyclical grant policies and the other four following an anticyclical pattern of grant disbursements, local investment expenditures were strongly destabilizing in all groups.[38]

The German experience thus appears to contrast with that in the United States and Canada in that State-local fiscal behavior in Germany has significantly accentuated the swings in levels of macroeconomic activity. The existing evidence, however, does not suggest that the Federal Government has been able to make effective use of intergovernmental grants to reverse this pattern of State-local budgetary behavior.

D. Further Thoughts on the Design and Use of Countercyclical Grants

In addition to the timing of grants, their *form* is important. Since the intent of countercylcical aid is to alter the temporal pattern of State-local expenditures, grant funds should take a form that discourages fiscal substitution and that offers a direct inducement to spending. From this perspective, unconditional, lump-sum assistance is the least effective type of aid, for it leaves recipients free to do whatever they wish with the monies. To stimulate State-local spending in recessions and dampen it in booms, Federal programs should tie grant funds to State-local expenditure decisions. The most direct way to accomplish this (as discussed in Part I) is through matching requirements. In a recession, for example, the Federal Government could implement new matching-grant programs and/or offer more generous matching terms for additional expenditures under certain existing programs. In this way, the States and localities could obtain these Federal grant funds only through budgetary expansion on the prescribed programs; they could not simply substitute the grant monies for their own revenues (or add the funds to their surplus).[39]

This suggests, moreover, that programs suitable for countercyclical assistance must possess an inherent flexibility. In particular, social service programs, many of which provide basic support for lower income families, are ill suited to cyclical variations in levels of Federal assistance; the disruptive effects could be quite painful. Following the Hansen-Perloff proposal of the 1940's, the Congressional Budget Office contends that an attractive candidate for countercyclical aid is capital construction grants.[40] Federal grants for the construction

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[38] It is the case, however, that during the 1966–67 recession, local public investment fell somewhat more in that group of States where State categorical grants for investment declined. It may be that the grants prevented local expenditures from falling by as much as they would have otherwise. Even were this the the case, Knott surmises that, "Even a fairly large program accounting for almost 50 percent of local investments cannot guarantee an anticyclical local-government spending policy." (p. 86)

[39] None of the current countercyclical programs in the United States requires matching. The Congressional Budget Office has called attention to this, but offers some reservations about matching requirements because, ". . . some grantees might be deterred from accepting the Federal funds because of the difficulty of raising the required matching money during a recession." (Countercyclical Uses of Federal Grant Programs, op. cit., p. 41.) The CBO suggests some other methods for limiting fiscal substitution such as earmarking of grant funds. Also see the CBO study for an assessment of the issues of "triggering" and "targeting" of grant funds—mechanisms for automatically turning the grant programs on and off over the cycle and for determining the distribution of the funds among jurisdictions.

[40] *Ibid.*, Ch. 6.

of highways or mass-transit facilities, for example, could be varied countercyclically to encourage an enlarged effort during periods of recession and reduced expenditure in times of expansion. The focusing of countercyclical aid on construction grants offers two important advantages. First, since large construction grants are often for specific projects that the recipient government would not have otherwise undertaken, there are very limited opportuntities for fiscal substitution; States and localities will, in general, be unable to use the grant funds to displace their own revenues. Second, many capital projects, like the construction of highways, have considerable flexibility; they can be speeded up or slowed down somewhat without serious disruption to the program.

This latter issue, however, does point up a fundamental problem in the use of grants (and particularly of categorical aid) for countercyclical purposes. Existing expenditure programs have their own rationale in terms of the allocative and distributive priorities of the various agents in the public sector. Their proper execution, moreover, typically requires a certain amount of planning and timing. To adapt these programs to countercyclical ends is not without cost. It is not a simple or costless matter, for example, to increase the flow of resources to highway construction and then to lay off workers and release other inputs in precise conformity with swings in the level of macroeconomic activity.[41] And to the extent this is achieved, it is bound to come at some expense to other public objectives. In brief, the attempt to regulate the flow of State-local spending for specific programs for macrostabilization purposes requires some loss in terms of the effectiveness of the programs on other criteria.

One could argue that, instead of discontinuities in State-local programs, countercyclical aid promises to stabilize budgets by providing additional funds at precisely those times when State and local tax collections are suffering from an economic downturn. From this perspective, Federal countercyclical grants could serve what the Congressional Budget Office has called a "fiscal stabilization" function; they could even out the flows of State-local revenues relative to changes in fiscal "needs." The difficulty there is that macrostabilization policy may, under certain circumstances, require flows of Federal aid that are quire different from those needed for fiscal stabilization. For example, during a period of inflation:

> Fiscal stabilization . . ., regardless of whether the inflation coincides with excess aggregate demand, may require an increase in grants to compensate for increased costs. Service provision demands a steady flow of resources in order that careful program development and implementation can occur and that vital activities not be disrupted.[42]

In short, macroeconomic stabilization and fiscal stabilization are not entirely consistent objectives in terms of their implications for Federal grant policy.

Perhaps more important, to the extent that Federal countercyclical assistance is successful in evening out flows of revenues to State and local governments, this aid may simply relieve State-local

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[41] For a careful study that explores the difficulties inherent in the use of highway programs for countercyclical ends, see Ann Friedlaender, "The Federal Highway Program as a Public Works Tool," in Albert Ando et al., eds., "Studies in Economic Stabilization" (Washington, D.C.: The Brookings Institution 1968), pp. 61–116.

[42] Congressional Budget Office, "Countercyclical Uses of Federal Grant Programs," p. ix.

officials of the need to make their own provision for cyclical forces on the budget. The earlier-cited evidence on State and local fiscal behavior suggests that, at least in the aggregate, the State-local sector has done a fairly decent job of building up stocks of financial assets during periods of expansion and drawing on those reserves to maintain spending during economic downturns. If Federal countercyclical grants were available, State-local officials might no longer find it necessary to maintain their own reserves. If this were to happen, Federal grants would have little macroeconomic impact; their primary effect would be to increase State and local dependence on the Federal treasury.

III. Reflections on the Evolution of Federal Grants Past and Future

As has been shown, the Federal grant system in the United States has not been static; it has undergone a continuing process of change both in size and structure. From a modest collection of programs and level of expenditures in 1950, it has grown rapidly to occupy a major place in the Federal budget. This has resulted both from the expansion of older programs and the addition of new ones. In the early 1950's, these grants consisted primarily of transfers to individuals under public assistance programs such as Aid to Families with Dependent Children (AFDC) and Old Age Assistance. The late 1950's brought the addition of the interstate highway program followed by grants for sewage treatment plants and support for other capital projects. Public assistance continued to grow with new programs such as Medicaid. And in the 1970's came General Revenue Sharing, consisting basically of unconditional transfers of funds to State and local governments. These examples, of course, are simply a few of the major developments in the grant system; as table 2 shows, the range of programs and the categories of support under existing Federal grants constitute an enormously complex structure of assistance. In light of this continuing evolution, this paper concludes with an exploration of some of the issues that have figured (and will continue to figure) in the deliberations and decisions concerning the form and extent of Federal intergovernmental grants.

A. The Grant System and Macroeconomic Stabilization

A major fiscal innovation of the 1970's has been the attempt to adapt various parts of the Federal grant system, including revenue sharing, to support Federal countercyclical policy. The findings in this paper, although admittedly based on quite limited evidence, point toward a pessimistic conclusion on this particular thrust of grant policy: existing empirical work on federal fiscal systems both here and abroad does not indicate much potential for Federal grants as a countercyclical policy tool. First, the State-local sector in the United States has not been, as some had thought, a historically destabilizing force in the economy; on the contrary, the budgetary patterns of State and local governments have, in the main, taken an anticyclical form. Second, the capacity of the Federal Government to have a significant short-run impact on State-local spending and taxes seems, at best, very limited. State and local governments (in the

aggregate at least) appear to handle their finances over the business cycle fairly well. Federal grants do affect their fiscal behavior, but only with a substantial time lag. The suggestion of studies, like that of Gramlich's, is that there may exist important parallels between the permanent-income hypothesis of individual spending behavior and the fiscal activities of State and local government. In particular, like individuals, State and local officials appear to pay little attention to purely temporary increases or decreases in receipts in making current budgetary decisions.

This is not to say that revenue sharing is an ineffective program. As Part I indicated, the grant system has a range of allocative and distributive objectives, and there are good reasons to believe that revenue sharing can make some valuable contributions to their realization. But the attempt to extend revenue sharing (and other grant programs) to include countercyclical elements does not appear very promising.

B. The Grant System and Income Equalization

In addition to its allocative and stabilization functions, the public sector has an acknowledged responsibility of promoting a more socially desirable distribution of income. This has taken the form, in part, of a set of transfer programs with funds targeted for low-income households. The development and structure of the U.S. system of income transfers is the subject of another study in this collection by Sheldon Danziger, *et al.*,[43] and a few of their findings are of interest here. In particular, their analysis reveals that, over the period 1965–76, the percentage of persons with pretransfer incomes below the poverty line declined hardly at all (from about 21.3 percent to 21.0 percent); moreover, this figure has actually risen during the 1970's from 18.8 percent in 1970 to 21.0 in 1976. Transfer programs, including both those that operate through Federal grants to States and localities and those that are direct Federal transfers to individuals, have had a real impact. The Danziger-Haveman-Plotnick estimates suggest that, in terms of posttransfer income, the incidence of poverty among persons has fallen from 15.6 percent in 1965 to 11.8 percent in 1976, a fall of roughly 25 percent in posttransfer poverty incidence. Moreover, after further adjustments for the underreporting of incomes, the payment of Federal income and payroll taxes, and the receipt of in-kind transfers, they estimate that the percentage of persons with incomes below the poverty line has fallen from 12.1 percent to 6.5 percent, a reduction of the poverty population by close to one-half. The intriguing and important finding is that growth in the economy itself appears not to have made much contribution to the real incomes of the poor; the source of real progress in the reduction of poverty over the past 15 years is the expansion in public transfer programs.[44]

In light of these findings, one might expect that Federal grants would exhibit a strongly income-equalizing pattern among States with more funds per capita going to the lower-income States. This would also be consistent with the goal of fiscal equalization that was examined in Part I of this paper. In fact, this is not exactly the case. Rudolph

[43] Sheldon Danziger, Robert Haveman, and Robert Plotnick, "The U.S. Income Transfer System: An Analysis of Its Structure and Impact," in this volume.

[44] This result is admittedly dependent, in part, on the choice of 1976 as the end point.

Penner found (see table 4) that the five poorest States in the United States receive only slightly more than average in Federal grants per capita; moreover, the five richest States also receive above-average totals of per capita grants.[45] This was true both in 1967 and 1975, but by 1975, the average per capita grant income in the five richest States had come to exceed that in the five poorest States.

Perhaps all this should not be too surprising. There are a great many grant programs with diverse allocative and distributive purposes that are obscured in the aggregate. What is true as Penner observes, is that the Federal grant system has something for everyone.

TABLE 4.—GRANTS PER CAPITA AND GRANTS AS A PERCENTAGE OF PERSONAL INCOME IN THE 5 RICHEST AND 5 POOREST STATES, 1967 AND 1975

	Grants as percent of personal income	Grants per capita
5 richest States, 1967:		
Connecticut	1.6	$62
New York	1.8	70
Illinois	1.5	56
California	3.2	118
New Jersey	1.3	48
Average, 5 richest	2.1	80
National average	2.5	78
5 poorest States, 1967:		
Mississippi	4.7	90
Arkansas	4.6	97
Alabama	4.0	87
South Carolina	2.7	59
West Virginia	4.4	103
Average, 5 poorest	4.0	85
National average	2.5	78
5 richest States, 1975:		
Connecticut	2.8	190
Delaware	3.4	226
Illinois	2.9	196
New Jersey	2.9	191
New York	4.2	276
Average, 5 richest	3.5	230
National average	3.8	221
5 poorest States, 1975:		
Mississippi	6.1	246
Arkansas	5.0	220
New Mexico	6.7	299
South Carolina	4.4	199
Alabama	4.9	223
Average, 5 poorest	5.2	229
National average	3.8	221

Source: Rudolph G. Penner, "Reforming the Grants System."

C. On Allocational Objectives and Grant Design

In addition to redistributive goals, many Federal grant programs have as their fundamental intention to induce certain responses from the States and localities; in our discussion of external effects, we noted the use of grants to encourage specific activities that confer benefits across jurisdictional boundaries. From this perspective, the design of individual grant programs is of paramount importance; such programs will not succeed in generating the intended response unless they provide the proper incentives to the recipients. This point deserves heavy

[45] "Reforming the Grants System," in Peter Mieszkowski and William Oakland, editors, "Fiscal Federalism and Grants-in-Aid." Note, however, the large variation among the five States in each category.

emphasis: it is not enough simply to channel funds to State and local agencies; the form of the grant must be such as to induce the desired budgetary (or other) outcome.

Moreover, as emphasized in Part I, this can be quite a subtle matter. Under a wide variety of circumstances, grant recipients can easily convert conditional grants into unconditional monies in the sense that the ultimate impact of a given conditional grant is identical to that which would have occurred had the funds come with no strings attached. Furthermore, such outcomes are not easy to detect: the only observable behavior is the pattern of fiscal response that the recipient chose after receiving the grant; it is hard to know exactly what would have happened in the absence of the grant (or if the grant had been unconditional rather than conditional). All is not, of course, lost; one can make inferences about these effects from a variety of evidence including econometric analyses. But, because of the fundibility of grant funds, it is not easy, and the findings are typically shrouded in some uncertainty.

In Part I we explored the importance of matching requirements as an inducement for fiscal expansion. Matching, in addition to making external funds available, generates a price effect by reducing the effective cost of the service to the State or locality. If the Federal Government were seeking to encourage the expansion of a number of particular State and local activities, we would expect to find a variety of grant programs, each with a narrowly defined scope and with either explicit or implicit matching provisions.

It is interesting in this regard that the 1960's were years of a proliferation of relatively specific Federal grant programs. In contrast, there were strong forces in the 1970's to stem this trend, first, through the consolidation of many individual programs into block grants providing funds for broadly defined functions and, second, through the introduction of revenue sharing. This was in part a reaction to the troublesome complexity of the emerging grant system, but also to some sense that the Federal Government was encroaching on State and local prerogatives.[46] The shift in the direction of block grants and revenue sharing indicates a movement in the Federal grant system away from direct influence on individual State-local services and toward a substitution of Federal revenues for State and local taxes. The Federal Government is, in effect, altering somewhat the structure of the tax system as a whole, and exerting less leverage on State and local provision of particular services.

What all this portends for the future is not very clear. But it does suggest that we must look hard at both the rationale for and the design of our grant programs. In particular, it is crucial that for each program we first establish explicitly the basis for Federal intervention and its objectives, and, second, that we design the grant program to achieve those objectives. Effective grant design requires both that the Federal Government adopt the proper form of grant and determine the grant parameters (e.g., matching shares) so that the program will generate its intended response from the recipients.

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[46] There was also evidence that some of these programs were badly designed and were having unanticipated (and undesired) effects.

FEDERAL CREDIT PROGRAMS

By George Aragon

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I. Summary

The Federal Government first used credit programs in 1916 and has since applied them to virtually every public policy objective. In the last 25 years, it has extended $1.5 trillion in credit. More than $400 billion in Federal credit was outstanding as of fiscal year 1978. Almost half this amount represented loan guarantees (net), and slightly more than a quarter involved direct lending. The remaining quarter represented loans held by sponsored credit enterprises. Gross lending and guaranteeing activities during fiscal year 1978 exceeded the total Federal budget for fiscal year 1967. And the net financing for these credit programs was about seven times the level of the 1967 budget deficit.

Despite the tremendous scale of Federal credit programs, little is known about their overall performance and effects. Throughout their history, these programs have generated serious public concern. Many have feared that such credit activities might seriously impair the efficiency of financial and economic markets, resulting in a serious misallocation of resources.

While credit programs are designed to meet specialized objectives, they sometimes have broader economic goals. Recent evidence, however, suggests that they are not very effective at the macroeconomic level. Credit programs have not been reliable or effective instruments for promoting full employment. As for price stability, credit programs have demonstrated a persistent inflationary potential. Sponsored

enterprise activities, in particular, have exhibited a pronounced pro-cyclical effect. Regarding income redistribution, these programs are less effective than direct grants. This is because of the lack of a method for measuring the subsidy values of credit extensions and for controlling the distribution of benefits.

Efforts to consider the full range of credit involvements will likely increase. But developing a comprehensive framework for federal credit programs won't be easy. Any attempt to improve coordination between credit activities and overall economic policy may result in the sacrifice of the goals of specialized programs.

During the 10-year period that ended in 1978, the level of credit outstanding increased by more than 130 percent. The fastest growing form of credit was lending by sponsored enterprises, which rose by more than 400 percent. But the effect of direct lending on budget totals actually diminished, because of the privatization of sponsored agencies, primarily the Federal National Mortgage Association; the creation of off-budget status for certain agency lending; and the formation of the Federal Financing Bank. Of all credit mechanisms, the use of loan guarantees have been the most pervasive, expanding greatly over the past 10 years. Loan guarantees are now included in all major functional areas of the budget, and in many respects represent true alternatives to direct budget outlays.

The most widely accepted function of credit programs has been the correction of market imperfections. The oldest, and by far the largest, credit programs have had this objective. Fundamentally distinct from these "perfecting" programs are "budgetary" or "fiscal" programs that pursue the same objectives as non-credit budget programs. Like other budgetary programs, these can be divided into two categories: income redistribution programs and programs that exploit economic externalities or pursue national, political goals. As of fiscal year 1976, market-perfecting programs represented more than 60 percent of all outstanding Federal credit. Income redistributing programs represented about 25 percent, while priorities/externalities programs represented about 10 percent.

Federal credit programs possess both programmatic and financing dimensions. Thus, consideration of a program involves two decisions. When a programmatic decision is linked to a financing mechanism, it should be explicitly recognized that the adoption of the program will reduce the remaining financing and program options. To the extent credit programs are interchangeable with non-credit budget outlays, credit programs are tempting "backdoor" financing devices. The financing requirements of credit programs of all types have been volatile and completely unreliable. Budget-year estimates for net changes in direct loan activities were off by more than 100 percent in 4 out of the 10 years, and in all cases the estimates were below the actual amount.

Currently, there is no effective way of valuing the subsidy element of Federal credit participation. According to one estimate, the total subsidy value of new direct lending and guarantee activities during the past 10 years has exceeded $80 billion.

In spite of the importance of the issues raised by Federal credit activities, relatively little empirical work has been done, and that which is available does not provide a firm basis for conclusions. The

uncertainties regarding the economic effects of credit programs can be summarized by two basic questions:

(1) Do credit activities produce lasting alterations in the composition and volume of credit?

(2) Do alterations in the composition and volume of credit produce predictable changes in the allocation of economic resources?

Early studies of credit programs, covering the period 1958–65, were more optimistic about the resource allocation effects than more recent studies. But the earlier studies considered only the primary effects of the credit programs and did not include the various offsetting financing and portfolio adjustment reactions of private markets. More recent studies, covering 1973–78, specifically incorporated the offsets directly into their models. They produced conclusions substantially at odds with the earlier studies with respect to most aggregate, long-run effects. Some agreement, however, does exist with respect to the importance of short-run effects. Other analyses have questioned the relationship of the financing mix to the allocation of economic resources, arguing that even successful alterations in the overall mix of credit do not result in parallel recompositions of real assets. For example, one study concluded that mortgage loans finance acquisitions of financial assets and real assets other than houses.

More study of credit programs is needed and will likely be forthcoming. At this point, however, an evaluation of program activities, individually or collectively, must go beyond the mere volume of credit flows. In particular, an effort must be made to examine the intricate pattern of market reactions over the long run.

II. Introduction

Federal credit programs are financing mechanisms designed to achieve certain public policy goals. These mechanisms often represent an attractive alternative to the vast array of other policy instruments available, such as direct budget outlays, tax expenditures, legislation, and mandatory credit allocation. All of these instruments vary greatly in both suitability and efficiency at accomplishing a specific policy task.

The use of credit programs to pursue policy objectives began around 1916.[1] Since then these programs have extended to almost every area of public concern: general economic stimulus; defense mobilization and peacetime reconversion; recovery from natural disasters; protection of strategic financial institutions, industries and economically important corporations; the development of new industries and the expansion of existing ones; economic stabilization of sectors and the economy as a whole; financial innovation and the promotion of financial competition; the development of the financial system and the perfection of markets; and the redistribution of income. Each credit program has represented a Congressional response to perceived public needs. Questions about the need for a particular program are outside the scope of the present discussion. Instead, this paper focuses on the effectiveness of credit mechanisms. In particular, it examines the available empirical evidence regarding the relationships among alternative financing mechanisms, the public policy implications of

[1] For a definitive, though now dated, compilation, see U.S. Congress, House Committee on Banking and Currency, Subcommittee on Domestic Finance, "A Study of Federal Credit Programs," 1964.

credit programs, and the effect of these programs on economic change over the coming decade.

A. Magnitude of Credit Activity

The Federal credit programs discussed in this paper include the lending activities of Federal agencies—such as direct lending, loan insuring, and loan guaranteeing—as well as those of sponsored credit enterprises. Over the past 25 years, the Federal government has extended at least $1.5 trillion in credit through these programs. Net of repayments, total credit outstanding at the end of fiscal year 1979 will be almost $500 billion, representing a net increase of $50 billion during the year, and a net increase of $300 billion since fiscal year 1968. Of the total $500 billion in credit outstanding, loan guarantees will total $214 billion,[2] direct lending $137 billion, and lending by sponsored enterprises $142 billion. Gross lending and guaranteeing activities during 1978 exceeded the Federal budget in fiscal year 1967. The net financing requirements of this activity during 1978 were about seven times the budget deficit for fiscal year 1967.

Collectively, Federal credit programs operate as a comprehensive financial institution, continually borrowing and relending in the credit markets or guaranteeing private borrowing and relending. During the period 1969–78, the Federal government accounted for approximately 14 percent of total domestic flows of credit.[3] The volume of loan assets held or guaranteed at the end of fiscal year 1979 will almost equal the total assets of the entire savings and loan industry, exceed total life insurance company assets by more than $100 billion, and exceed the combined assets of mutual savings banks and credit unions by more than $200 billion.

Credit mechanisms are often classified according to the following generic functions:[4] Programs attempting to compensate for or correct market imperfections; programs attempting to assist marginal or needy borrowers; programs designed to redirect economic resources according to altered national priorities; and programs designed to exploit economic externalities.[5]

B. Effectiveness

Despite the tremendous scale of Federal credit programs, little is known about either their overall performance or effects. No truly comprehensive study of Federal credit activity has appeared in the last 15 years.[6] Earlier work is not only out of date, but also suffers

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[2] This is a net figure and excludes guarantees on securities backed by guarantees as well as guarantees on direct loans by agencies and sponsored enterprises. The gross guarantee figure for 1979 is about $360 billion.

[3] If financing of the budget deficit is included with credit program financing, total Federal financing averaged 25 percent of total domestic credit flows during the period 1969–78.

[4] For a recent classification of loan guarantees, see Mitrisin, "Federal Loan Guarantees . . .", 1977. A recent identification of loan guarantee programs is in U.S. Congress, House, Committee on Banking, Finance and Urban Affairs, Subcommittee on Economic Stabilization, Catalog of Federal Loan Guarantee Programs, 1977.

[5] These last two groups are difficult to describe precisely since they overlap with market-prefecting and subsidy-type programs in several respects. But even in a world of perfect financial markets and no need borrowers, priority-related programs might still be used; for example, to increase national investment in education or defense activities. Economic externalities might still exist in pollution abatement and reclamation programs.

[6] For recent reviews, however, see Weidenbaum, "An Economic Analysis of the Federal Government's Credit Programs," U.S. Congress, Committee on Banking, Currency and Housing, Loan Guarantees and Off-Budget Financing, 1976. Also see Larkins, "$300 Billion in Guarantees," 1972. Also see OMB, "Federal Credit Programs," in Special Analyses of the Budget, annual; and Congressional Budget Office, "Loan Guarantees; Current Concerns and Alternatives for Control," 1978.

from a relatively narrow analytical framework.[7] More recent work exhibits a narrowness of its own by focusing on mortgage programs. These recent studies reveal little or nothing about the performance of newer or generically distinct types of credit activity. Still, as a whole, empirical work in this area has raised serious questions about the effectiveness of credit programs and identified a number of problems that demand further study.

Unfortunately, it is difficult to analyze the effectiveness of a program, because of the inherent inability to compare the program's performance to an alternative situation where it was not instituted. For example, an analysis of the impact of mortgage insurance programs on private home ownership would most properly consider the extent of home ownership with and without the Federal insurance program. Such comparisons are clearly impossible, which suggests that the contributions of such programs to financial innovation and the development of the financial system are understated. Empirical work has been further limited by a failure to consider the relative effectiveness of various alternatives to credit mechanisms. It is important to keep these qualifications in mind when analyzing recent empirical work, which has been almost uniformly pessimistic about the long-run effectiveness of credit programs.[8] Both recent and earlier studies, however, agree that the short-run impacts of credit programs can be significant.

III. Principal Policy Implications and Prospects

Throughout the existence of Federal credit programs, there has been serious concern that they might impair the efficiency of various markets. Today, this concern has become especially acute with the broad sentiment for greater control over all types of Federal activity. Still, Federal credit programs continue to increase in both number and variety, accelerating the trend toward massive financial intervention. Linked to these characteristics of credit activities is a growing uncertainty about their costs and benefits, particularly in the absence of some form of overall coordination or control.

A. Previous Studies and Recommendations

During the past 30 years, credit activities have been examined by Presidential commissions, Congressional committees, private organizations and academic researchers. In addition, the Office of Management and Budget (OMB) prepares a "Special Analysis of Federal Credit Programs" annually. Uniformly, studies that focused on the public policy implications of Federal credit activities have suggested the need for more coordination and control over the growth and use of Federal credit mechanisms. Table 1 summarizes these studies and their principal recommendations.

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[7] Primarily, the concentration on primary effects and the failure to incorporate private market feeback effects. Most authors recognized these shortcomings and had no effective way of overcoming them. More recent efforts have employed "funds-flow" models.

[8] Studies by Duesenberry, Bosworth, Hendershott, Villani, Meltzer, Jaffee, Rosen, and others are discussed later.

TABLE 1.—*Summary of Policy Studies*

1. Government Corporation Control Act, 1945[1]

Reviewed programs to improve accountability to Congress; requires budgetary and audit procedures and Treasury review of security issues by wholly-owned or mixed-ownership corporations.

2. First Hoover Commission, 1947[1]

Especially critical of loan programs. Direct lending viewed as possibly corrupting, inviting political and private pressure; to be used only in emergencies. Guarantees considered better, but only if not otherwise available. A dissenting view was that guarantees provided more risk to government interests. Moreover, there was concern that guarantees caused circumvention of budget and audit controls of the Corporation Act. Recommended establishment of National Monetary and Credit Council to advise on policies and coordination of domestic lending and guarantee activities.

3. Second Hoover Commission, 1953[1]

Advocated curtailment of many lending programs and restriction to only those uses that private business could not or would not undertake and that were justifiable as government purposes. Congress did not generally adopt its recommendations.

4. Commission on Money and Credit, 1960[1]

Market-perfecting programs should be self-supporting. Loan insurance was preferable to loans. Public purpose reallocations required subsidies in the form of below-market interest rates. Choice of credit program should be based on least cost and least interference. Loan programs should not be insulated from cyclical credit fluctuations. Credit programs should reinforce monetary policies.

5. Committee on Federal Credit Programs, 1963[1]

Usual order of priority should be guarantees, new private institutions, government secondary market, direct loans. Secondary market operations sould be consonant with monetary policy. Agencies should emphasize innovation and accelerate privatization. Market-perfecting programs should charge "market" rates. Public purpose programs should employ cost/benefit analysis.

6. Committee to Reappraise Federal Credit Programs, 1969

All federally-aided credit, whether direct loans or guarantees of Federal and sponsored agencies, should be subject to direct or indirect controls that consciously ration the total amount of credit in light of general economic situation. New Federal credit programs should be introduced only if subject to such controls that would avoid aggravation of inflationary pressures on financial markets.

[1] U.S. Congress, House Committee on Banking and Currency, Subcommittee on Domestic Policy. "A Study of Federal Credit Programs," February 28, 1964.

B. Impacts on Major Economic Factors Over the Next Decade

This section summarizes the role of credit programs over the decade of the 1980's with respect to their impacts on major economic factors. This summary and projection is based on both past experience with the credit programs as a whole and the probable change in program activity.[9]

The principle economic factors considered here are the presumed objectives of economic policy: full employment, price stability, income redistribution, and coordination with other national priorities. The effect of credit programs on each of these factors is examined with

[9] Section VI reviews the available empirical work in this area.

respect to their more specialized goals.[10] Then the paper summarizes the experience with credit programs and develops some assessment of the performance to be expected over the next 10 years. In developing this assessment, it is assumed that the mix of credit activities will continue to reflect recent changes. Table 2 outlines the discussion.

TABLE 2.—IMPACTS ON MAJOR ECONOMIC VARIABLES

Economic variable	Need	Experience	Prospect
Full employment	(1) Promote innovation.	(1) Strong successes.	(1) Will continue to sponsor high risk ventures.
	(2) Promote economic efficiency.	(2) Successful in some areas.	(2) Not certain without better measurement.
	(3) Stimulate new spending.	(3) Successful in some areas.	(3) Perhaps investment rather than consumption.
Price stability	(1) Countercyclical.	(1) Not always responsive.	(1) May require a formal policy coordination.
	(2) Promote economic efficiency.	(2) Often a better record.	(2) A severe reorientation of some programs.
		(3) No overall attempt.	
Income redistribution	(1) Good measure of subsidy.	(1) Subsides not well defined or measured.	(1) No change.
	(2) Control of benefit flow to recipient.	(2) Unintended subsidies not avoidable.	
		(1) Subsidies not well controlled.	
		(2) Some undesirable redistributions.	
Coordination with other national priorities.	(1) Consider in an integrated manner.	(1) Have escaped full comparative analysis.	(1) Proposals for change.
		(2) Most exempt from Budget Act.	(2) Analytic framework needed.

FULL EMPLOYMENT

Credit programs promote full employment by stimulating innovation and investment, increasing economic efficiency, and encouraging new spending. In the past, credit programs have demonstrated dramatic success in bringing about both technological and economic innovations. The farm credit system, for example, encouraged the development of efficient farm machinery. It also brought about financial innovation, including the development of new financial infrastructures and instruments. Similar innovation has occurred in the housing and mortgage insurance markets. Credit programs have also played a vital role in the economy by providing high-risk capital, and thus channeling domestic investment to new, productive areas. They have supplied long-term funds to small business, and, most recently, underwritten the technological and other risks of synthetic fuel programs. While high-risk ventures necessarily carry high political costs, it is probable that this unique role of credit programs will continue.

The impact of credit programs on economic efficiency is not clear-cut The farm credit system has contributed to improvement in farm technology and distribution methods. And credit programs that successfully stabilize the housing construction industry may increase economic efficiency by reducing the gyrations of productive resources into and out of the industry. But in other areas, credit programs may not have as beneficial an effect. Loans and guarantees extended to large, though unprofitable, companies or municipalities are not likely to encourage efficiency, although they may clearly serve other purposes.

[10] Given this aggregative perspective, it is necessary to remember that programs also have more specialized missions. A program that fails to satisfy broad economic objectives may successfully meet its own specialized purposes.

Programs aimed at marginal or needy borrowers also are not likely to promote maximum efficiency, but they may accomplish other important national objectives. A different problem results from credit programs, such as market-perfecting programs, that supply unneeded subsidies. The reason these programs are not efficient is that the eligibility criteria for extending credit are not necessarily related to competitive factors.

With respect to stimulating new demands, the past experience is not conclusive. Credit programs may simply provide a cheaper alternative credit source and thus displace private credit flows with no net impact on overall spending. Or, to the extent credit programs successfully add to one type of spending, they may draw funds away from others, and in so doing crowd out other private credit demands. New spending is most likely to occur when credit is extended to needy or marginal borrowers, since they would not otherwise have credit. Similarly, extension of credit through market perfecting activities, such as those directed toward small businesses, will also produce spending that otherwise would not occur. These, again, are only the initial results of credit activity. The final effect on overall spending depends on whether other lenders or borrowers are displaced. The extent of displacements, in turn, will be heavily influenced by the monetary conditions existing at the time. A further complication is that an increase in spending for the outputs of a given sector may be absorbed in higher prices without increase in overall employment.

During periods of high unemployment, a desirable quality of credit programs would be sizeable expansions of activity. This was not the experience, however, during the two most recent recessions. While persistently positive, the net amount of credit extended under these programs actually declined during the 1969–70 recession and decreased slightly during the 1974–75 recession. Substantial increases in direct lending and guarantee activities during those two recessions were necessary to offset collapses in sponsored enterprise credit extensions.[11]

In summary, the contributions of credit programs to full employment remain inconclusive. Specialized program objectives, such as income redistribution, often conflict with the maximizing of economic efficiency and long-run economic growth. Programs directed at the perfection of financial markets and the provision of high-risk capital, however, promote innovation, investment, and economic efficiency. Credit programs have not provided desired expansions of activity during the two most recent recessions. By their nature, high-risk investments have uncertain future payoffs. Considering this uncertainty and the likely prospect of continued credit extensions in economically sub-optimal areas, credit programs are not effective instruments for promoting full employment.

PRICE STABILITY

Desirable program characteristics in this regard would be countercyclical behavior and the promotion of economic productivity. Credit activity during the past decade has not served as an effective instrument of economic stabilization. During the 11-year period 1969–79, net credit extended under Federal auspices was positive in every year

[11] Net credit extended by sponsored enterprises dropped from $10.6 billion in fiscal year 1970 to $1.3 billion in fiscal year 1971; and, from $16.3 billion in fiscal year 1974 to $8.5 billion in fiscal year 1975 and $5.4 billion in fiscal year 1976.

including fiscal years 1969 and 1970, two years in which the budget, excluding on-budget direct loans, was in surplus ($6.1 billion in 1969; $1.7 billion in 1970). In fact, net credit demands on the financial markets for the 11-year period exceeded the financing requirements of the budget deficits by about $60 billion over the same period. Credit activity has actually operated in a procyclical fashion during the two most recent expansions. From fiscal year 1971 to 1974, total credit advanced increased from $16.5 billion to $26.9 billion. From fiscal year 1976 to 1978, total credit extended increased from $26.6 billion to $59.0 billion. The most severe procyclical pressures have come from sponsored enterprise activity, while direct lending and guarantee activities have operated generally countercyclically, and have thus dampened the impact of enterprise lending activity.[12]

The significant procyclical behavior of sponsored enterprises reflects the attempts, particularly by mortgage credit programs, to protect various sectors of the economy. The objectives of certain programs (e.g., stabilization of mortgage credit flows) often conflict with broader economic objectives, which suggests that such programs are designed to meet other urgent public needs.

As for contributions to economic productivity, the earlier discussion of economic efficiency applies. Credit programs have proven their ability to produce significant advances in productivity and innovation (agriculture, for example). This must be balanced against sizable credit allocations to marginal users of credit and the possible displacement of economically more productive uses of credit.

Over the next 10 years, growth in net credit extended seems certain, resulting in a persistent upward pressure on prices. The growth of sponsored enterprise activity, in particular, is crucial, since these programs have been decisively procyclical. An extrapolation of growth during the 1968–78 period reveals that by 1988 sponsored enterprise credit outstanding will be two-thirds of the total compared to less than 30 percent in 1978. Thus, credit programs will contribute little to price stability in the foreseeable future.

INCOME REDISTRIBUTION

A desirable quality for a program in this area is a method for accurately measuring the amount of income to be allocated to particular beneficiaries. The record of credit programs is mixed. Subsidies are explicit or implicit in all forms of credit extended, but accurate measures of the real subsidy value extended have not been possible. In some sense, this measurement is a technical problem. But it remains at the heart of credit programs, since it is the level of subsidy which distinguishes Federal credit programs from private credit allocations. An estimate of interest subsidies of direct loan obligations and guaranteed loan commitments in fiscal year 1978 prepared by the Office of Management and Budget ranged from $8 billion to $15 billion. Because of the difficulty in quantifying subsidy values, there is no assurance that such values will be properly evaluated in otherwise private transactions or that they will flow to the intended party. This is a particularly troublesome aspect of loan guarantees, which do not involve immediate costs to the government.

[12] Net credit extended by sponsored enterprises increased from $1.3 billion in fiscal year 1971 to $16.3 billion in fiscal year 1974. Net credit increased from a level of $5.4 billion in fiscal year 1976 to $27.9 billion in fiscal year 1978.

Empirical work has revealed other undesirable impacts on income redistribution. For example, the mortgage credit programs of agencies and sponsored enterprises have the intended effect of reducing mortgage rates to borrowers, but simultaneously reduce mortgage returns to lenders (especially savings and loan associations which must invest in mortgages), and hence depositors. One study of these effects concluded that activities of credit agencies during the 1968–70 and 1973–75 periods resulted in a net loss to the lowest income quintile of about $1 billion and that the net gain to the highest income quintile was about $1 billion. The second lowest quintile lost another $560 million compared with a gain to the second highest income quintile of $600 million. A different study, which focused on the risk and income distribution structures of the mortgage insurance program, found redistribution effects that favored lower income groups.[13]

Given the absence of a method for measuring the subsidy values of credit extensions and of controlling the distribution of benefits, credit programs are less effective than direct grants in achieving income redistributions.

COORDINATION WITH OTHER NATIONAL PRIORITIES

In addition to questioning the value of particular programs, a desirable goal of public policy would be the consideration of credit programs in the context of the full array of alternatives, as is now being attempted for budget expenditures. The record with respect to credit programs indicates that they have escaped full comparative analysis at the time of adoption; and even under the provisions of the Congressional Budget Act, they will, for the most part, continue to avoid integrated analysis. Yet, even if all direct lending were made subject to the Budget Act procedures, by fiscal year 1988 this would account for only about 25 percent of total credit outstanding in that year, according to our estimates of credit activity over the next 10 years. Still, given the current sentiment of Congress and the Administration, some attempt will likely be made to develop a comparative framework for credit activities. Construction and interpretation of such a document, however, is likely to pose serious political and technical problems.

Coordination of credit activities with overall economic policy objectives is another area of difficulty. Protection of favored sectors or clienteles by credit programs implies insulation from adverse fiscal and monetary policies. During the 1969–78 period, agency lending and guarantee activities operated overall much more in concert with fiscal and monetary policies than did sponsored enterprise activities. Greater coordination in this area involves the possible sacrifice of specialized program objectives.

IV. Scale and Growth of Federal Credit Activity

From fiscal year-end 1968 to fiscal year-end 1978, total Federal credit outstanding increased from $189 billion to $440 billion, or 134 percent (see table 3). Over the 10-year period, lending activities of sponsored credit enterprises demonstrated the most rapid growth

[13] These studies are discussed in detail later.

(443 percent),[14] as loan assets held increased from $23 billion to $126.8 billion by year-end 1978. Direct lending by Federal agencies increased by 110 percent over the same period, rising from $57 billion to $120 billion. Off-budget lending, however, accounted for the major growth in agency lending activity. On-budget lending increased by approximately 34 percent over the 10-year period, while off-budget lending grew 75 percent.[15] Guarantees, on a net basis, increased by 80 percent, rising from $108 billion to $193 billion. The growth figure for guarantee activity, however, is seriously understated, since guaranteed loans held in portfolios of Federal agencies or sponsored enterprises are counted as loans rather than guarantees.[16] On a gross basis, loan guarantees actually increased from $108 billion in 1968 to $360 billion in 1978 or by 233 percent.

During fiscal year 1978, credit outstanding increased by $59 billion. Almost one-half (47 percent) of the increase was attributable to growth in sponsored enterprise portfolios. Another 34 percent of the increase resulted from growth in primarily on-budget, direct lending by Federal agencies.

TABLE 3.—FEDERAL CREDIT OUTSTANDING

	1968	1978(A)	1979(E)	1980(E)
Direct lending:				
On-budget		$76.5	$81.5	$84.3
Off-budget		43.9	55.9	67.7
Total (percent change, 1968–78=110 percent)	$57.2	120.4	137.4	152.0
Guaranteed lending [1] (percent change 1968–78=79 percent)	108.1	193.1	213.9	239.4
Sponsored enterprises (percent change 1968–78=443 percent)	23.3	126.8	142.3	160.7
Total, Federal credit (percent change 1968–78=134 percent)	188.6	440.4	493.6	552.0

[1] See following table:

	1978(A)	1979(E)	1980(E)
Guaranteed loans gross	$317.3	$360.5	$408.8
Less secondary guarantee and direct lending purchase	−91.2	−113.0	−135.1
Primary guarantee loans	226.1	247.5	273.7
Less sponsored enterprise purchases	−33.0	−33.6	−34.3
Net guaranteed lending (primary, adjusted)	193.1	213.9	239.4

Sources: Office of Management and Budget, Federal Credit Programs, "Special Analyses of the Budget," various issues.

TABLE 3A.—PROJECTION OF TOTALS FOR CREDIT PROGRAMS, FISCAL YEARS 1978–88

	Percent increase, Fiscal years 1968–78	1978	1988
Direct lending	110	$120.4	$253
Guarantees	79	193.1	346
Sponsored enterprises	443	126.8	689
Total	134	440.4	1,030

Source: Calculated from table 3, supra.

[14] As of 1969, totals for FNMA were moved from direct agency lending to sponsored enterprise lending.
[15] All agency lending in 1968 is shown as on-budget.
[16] Thus, a guaranteed loan acquired by the Federal Financing Bank (FFB) is counted as a loan rather than a guarantee.

The remaining 19 percent reflected a rise in net guarantees outstanding.[17] The overall increase of $59 billion in credit outstanding, however, understates the scale of credit activity undertaken during fiscal year 1978. The gross credit activity during 1978, before subtraction of repayments and other liquidations, totaled $156 billion. As mentioned earlier, credit activities are approaching a scale which is comparable with overall Federal outlays.

A. Direct Lending

Over the past 10 years, three important changes have diminished the impact of direct lending on budget totals. The first of these was the privatization of sponsored agencies, which had the effect of removing their activities from the budget. The second change was the creation of off-budget status for certain Federal agencies, thus removing these activities from the outlay totals of the budget. The third major innovation has been the development of the Federal Financing Bank (FFB) mechanism.

Privatization.—As of 1969, three major credit enterprises were converted to private ownership: Federal National Mortgage Association (FNMA), Banks for Cooperatives, and Federal Intermediate Credit Banks. Between 1969 and 1979, these three programs increased at a rate of 350 percent, resulting in an increase in outstanding loans of $50 billion during the 10-year period (see tables 4 and 5).

TABLE 4.—GROWTH OF PRIVATIZED AGENCIES

	Outstanding		Percent change, 1969–79
	1969	1979	
FNMA	$8.3	$41.6	400
Banks for Cooperatives	1.6	6.7	320
Federal Intermediate Credit Banks	4.4	15.5	250
Total	14.3	63.8	350

Source: Office of Management and Budget, Federal Credit Programs, "Special Analyses of the Budget."

[17] Again, this is a net figure. Gross guarantees extended during 1978 were $99.6 billion.

TABLE 5.—FEDERAL PARTICIPATION IN DOMESTIC CREDIT MARKETS

[In billions of dollars]

	Actual											Estimates	
	1969	1970	1971	1972	1973	1974	1975	1976	TQ	1977	1978	1979	1980
Total funds advanced in U.S. credit markets[1] (includes equities)	96.9	93.6	124.9	162.8	206.9	193.0	179.7	248.0	67.9	319.5	366.9	[2]	[2]
Advanced under Federal auspices	15.0	17.6	16.5	22.8	26.7	26.9	26.9	26.6	6.6	36.6	59.0	53.2	58.4
Direct loans:													
On-budget	2.9	4.5	3.0	2.7	.3	2.2	4.3	4.2	1.1	2.6	8.6	5.0	2.8
Off-budget				.2	.7	2.2	8.5	6.7	2.6	9.0	11.2	12.0	11.8
Guaranteed loans	7.8	2.3	12.2	15.6	14.0	6.2	5.7	10.3	−.1	14.1	11.3	20.8	25.5
Government sponsored enterprise loans	4.3	10.6	1.3	4.3	11.6	16.3	8.5	5.4	2.9	11.0	27.9	15.5	18.4
Federal participation rate including Government-sponsored enterprises (percent)	(15.5)	(18.6)	(13.3)	(14.0)	(12.9)	(14.0)	(15.0)	(10.8)	(9.8)	(11.5)	(16.1)		
Total funds raised in U.S. credit markets[1]	96.9	93.6	124.9	162.8	206.9	193.0	179.7	248.0	67.9	319.5	366.9		
Raised under Federal auspices	11.3	16.4	32.2	39.7	46.5	24.0	64.8	97.5	19.1	79.0	94.5	73.4	80.9
Federal borrowing from public	−1.0	3.8	19.4	19.4	19.3	3.0	50.9	82.9	18.0	53.5	59.1	40.0	39.0
Guaranteed borrowing	7.8	2.3	12.2	15.6	14.0	6.2	5.7	10.3	−.1	14.1	11.3	20.8	25.5
Government-sponsored enterprise borrowing	4.5	10.3	.6	4.7	13.2	14.8	8.2	4.3	1.7	11.4	24.1	12.6	16.4
Federal participation rate (percent)	(11.7)	(17.6)	(25.8)	(24.4)	(22.5)	(12.5)	(36.1)	(39.4)	(28.2)	(24.8)	(25.8)		

[1] Nonfinancial sectors. Source: Federal Reserve Board Flow of Funds Accounts. Estimates from table E-10.

[2] Not estimated.

Source: Federal Credit Programs, Special Analysis F; "Special Analyses Budget of the United States Government," fiscal year 1980, p. 135, Office of Management and Budget.

Off-budget entities.—As of 1979, off-budget entities included the Rural Electrification and Telephone Revolving Fund, Rural Telephone Bank, Federal Financing Bank, and one program of the U.S. Railway Association. The net outlays of these entities add to the Treasury financing burden, although they do not appear on the budget. In fiscal year 1978, financing the deficit of off-budget entities represented over 17 percent of Treasury financing. In 1979, financing the deficit of off-budget entities is expected to represent 24 percent of Treasury financing, 29 percent by 1980, and 90 percent by 1981. By 1982, the deficit from off-budget Federal entities is expected to reduce the anticipated budget surplus by $11 billion, or 29 percent. At the end of fiscal year 1978, these agencies had about $44 billion in loans outstanding.

Federal Financing Bank.—Since 1969, the most significant development in direct lending has been the formation and growth of the Federal Financing Bank. In fiscal year 1975, after a year of operation, the FFB had approximately $6.3 billion in loan acquisitions outstanding. By 1978, the total had increased to almost $34 billion, and by fiscal year 1979 it is expected to total $45.4 billion. Out of an increase in direct lending totaling $63 billion between 1975 and 1979, operations of the FFB account for $39 billion, or more than 60 percent. Among its numerous effects on credit operations, FFB acquisitions tend to reduce the observed impacts of direct lending activities. For example, at year-end 1979, direct loans outstanding by the Farmers Home Administration (FHA) are expected to be $1.8 billion; yet the volume of new transactions alone during the year are expected to be $10.1 billion. Offsetting the new transactions will be an increase in FFB acquisitions of Farmers Home Administration CBOs totaling about $7.7 billion. In essence, the scale of activity can be considerably understated when FFB transactions are involved. In fiscal year 1979, FFB holdings of the Farmers Home Administration CBOs will total $28.4 billion.

FFB purchases of guaranteed loans extended by sponsored enterprises have similar effects and, in addition, result in a conversion of guarantees into direct loans. For example, FFB holdings of guaranteed international security loans will total $5 billion in 1979. Holdings of loans guaranteed by the Rural Electrification Administration will total another $6.7 billion in 1979. Holdings of Student Loan Marketing Administration guaranteed loans will total an additional $1.3 billion as of 1979. These four programs will total $41.4 billion in outstanding FFB acquisitions in 1979, or more than 90 percent of total FFB holdings.

During 1979, new direct loan transactions will amount to $44.2 billion, but of this amount only $17.0 billion will be added to the outstanding loan balance. Offsetting transactions will total $27.2 billion. Repayments will represent $14.7 billion, and FFB purchases will represent $8.3 billion.

B. Guarantees

Of all credit mechanisms, loan guarantees are the most pervasive. Gross total guarantees outstanding at the year end 1979 are expected to be over $360 billion. When adjusted for secondary guarantees, the total is about $250 billion. Even so, guarantees represent the broadest form of credit activity by far. Guarantees have also shown a rapid

rate of growth, tripling during the 10-year period 1969–79. An Expansion in the range of guarantee programs has been associated with this growth. Guarantee programs appear in all major functional areas of the budget, and in many respects, represent true alternatives to direct budget outlays.

C. Federally Sponsored Credit Enterprises

Federally sponsored credit enterprises have exhibited the most dramatic growth of all credit operations during the last 10 years. Outstanding loans of these enterprises rose from $23.3 billion in 1968 to $440.4 billion in 1978.

Activities of these agencies have centered on housing and farm credit. Since 1974, the Student Loan Marketing Administration has supplied credit to college students, although the amount outstanding is not sizable by comparison to other credit extended.

Beyond the sheer growth in sponsored enterprise activities, it is extremely important that they operate as wholly private financial institutions, yet possess undeniable competitive advantages over private, nonsponsored enterprises. Thus, they have the potential for uncontrolled growth in the financial markets, with serious implications for other credit programs, and may present a real threat by displacing other private intermediaries.[18]

V. Analytical Aspects of Federal Credit Programs

This section of the paper analyzes the essential functions and purposes of Federal credit programs in more detail. It considers the relationships of these programs to other Federal policies and examines both their effects on important economic variables and their impact on decisions in the private sector.

A. Functions of Federal Credit Programs

Despite the great diversity of credit activities over time, certain basic purposes are identifiable. Since the early part of this century credit programs have been used as market perfecting devices to assist in the evolution of the financial system and in the correction of inefficiencies. In addition, credit programs have operated as "fiscal" or budgetary devices intended to stimulate or stabilize the economy overall, redistribute income, pursue political priorities, and exploit economic externalities.

MARKET PERFECTING ACTIVITIES

The most widely accepted functions of credit programs have been those directed at overcoming existing market imperfections. The earliest, and by far the largest, credit programs have been directed toward this objective. Operationally, market imperfections have been presumed to exist when potential borrowers cannot get credit at reasonable cost. The unavailability of credit may be attributable to absence of financial institutions such as existed in rural or farming

[18] "The growth of the sponsored agencies, particularly FNMA, is not called for in their charters. The primary cause of the growth appears to be the monetary reward to be gained. Because FNMA can borrow at virtually the risk-free Treasury rate, borrowing and investing in mortgages is profitable. It is profitable both for FNMA shareholders and for mortgage bankers who originate and service most of the mortgages FNMA purchases." Hendershott & Villani, "Regulation and Reform of the Housing Finance System," 1977, p. 44.

areas prior to development of the Federally-sponsored farm credit system.

Market imperfections may also be due to inherent flaws in security instruments. This was the case of residential mortgage instruments—which lacked liquidity and had onerous terms for borrowers and correspondingly high risks for lenders—prior to the FHA insurance program and the sponsorship of the Federal National Mortgage Association to provide a secondary market for insured mortgages.

At times the market imperfection has been an absence of high-risk capital, such as provision of term credit to viable small businesses, or credit for foreign trade, or to large, new unproven technologies and industries such as synthetic fuel plants.

The main instruments of market perfection have been financial innovations, financial infrastructure development, financial entrepreneurship, expansion of credit services and instruments, liberalization of credit terms, and the improved mobility of financial resources.

"FISCAL" ACTIVITIES

Fundamentally distinct from the perfecting programs are "budgetary" or "fiscal" programs that pursue objectives similar to non-credit budget expenditures. In these programs, the concern over the proper balance of private and public interests becomes especially important. In their fiscal aspects, credit programs have also been used to stimulate overall economic growth and to stabilize economic activity. These latter objectives were particularly important during the 1930's when the Reconstruction Finance Corporation and the Industrial Loan Program of the Federal Reserve System were instituted.[19] More recently, sectoral stabilization rather than general stabilization activities have been dominant.

Like other budgetary programs, these "fiscal" types of activities can be separated into income redistribution programs and those programs which attempt to exploit economic externalities or the pursuit of national, political objectives. The principal credit instruments employed to achieve budgetary-type objectives are explicit and implicit subsidies. An explicit subsidy is the extension of credit (for example, under a direct Federal loan) at rates below Treasury cost. An implicit subsidy is related to the "true" market cost to the borrower. The total subsidy is the sum of the explicit and implicit subsidies. The implicit nature of some subsides does not make them any less a subsidy. Implicit subsidies represent a value transfer which alters the distribution of income in the direction of certain users and uses.

The mechanism, or subsidy, employed is, at least in principle, completely interchangeable with cash grants or tax expenditures.[20] [21] [22] [23]

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[19] Saulnier, et al., "Federal Lending and Loan Insurance," 1958, p. 139.

[20] Ibid, p. 123.

[21] "In a wide variety of instances, similar programmatic objectives of the Federal Government can be achieved either with cash payments, credit assistance, or tax incentives." Office of Management and Budget, "Federal Credit Programs", p. 133, in Special Analyses, Fiscal Year 1980.

[22] According to Law, this was the effect of CCC guarantees or price support loans "and the techniques could be widely expanded." Law, "The Aggregate Impact of Federal Credit Programs on the Economy," in Commission on Money and Credit, Federal Credit Programs, p. 301.

[23] According to Break, some guarantee programs are intended to postpone rather than replace budget outlays. ". . . agricultural price support loans guaranteed by the Commodity Credit Corporation (CCC), defense production loans (v-loans), and local authority notes and bonds guaranteed by the Public Housing Administration (PHA) and Urban Renewal Administration (URA), all tend to postpone, rather than to reduce or eliminate, Federal budget expenditures." Break, "The Economic Impact of Federal Loan Insurance," 1961, p. 18.

For example, a direct Federal loan carrying an interest rate of 5 percent when the Treasury borrowing rate is 8 percent and a comparable "market" rate would be 10 percent, provides a 3 percent explicit subsidy and an additional 2 percent implicit subsidy. The total subsidy of the direct loan program, and thus, its total value, is 5 percent per annum. This arrangement is equivalent in principle to a guarantee program which results in the private borrower paying 9 percent augmented by an annual cash grant of 4 percent. The total subsidy is still 5 percent, comprised of a 4 percent explicit subsidy and a 1 percent implicit subsidy. Furthermore, these are equivalent in principle to a direct cash grant program paying 5 percent per annum and otherwise not intervening in the private transaction . Finally, the interchangeability of these mechanisms with tax expenditures can be demonstrated by making the interest income to the lender exempt from Federal taxes. Lenders in a 50 percent tax bracket (and higher) will find it profitable to lend at 5 percent tax-exempt.

While the above arrangements are interchangeable in principle, they are far from being so in practice, primarily because of the different budgetary treatments of these devices. This aspect of Federal credit programs will be discussed later in this paper.

INCOME REDISTRIBUTION PROGRAMS

These programs are identifiable by their relatively low interest rates, strict eligibility requirements (e.g., borrowers must be in lower income brackets or in depressed economic areas). A combination of characteristics, rather than any individual one, distinguishes these programs as transfers of income. This is because programs based on political priorities might offer such loans to strong borrowers. An example of an income redistribution program would be the *Very Low Income Housing Repair Loans* (insured) of the Farmers Home Administration, part of the Department of Agriculture. The program is directed toward low income farmers in rural areas, and loans under the program have a statutory interest rate maximum of 1 percent. "The 1 percent interest rate is subsidized up to the Treasury's cost of borrowing." [24]

POLITICAL PRIORITIES/EXTERNALITIES

These programs attempt to reallocate resources in line with national priorities.[25] They are fundamentally distinct from other types of programs, since they are "neutral" with respect to market perfecting or income redistribution functions. Priority-related programs may, for example, improve academic [26] or medical facilities,[27] promote the growth and modernization of the Merchant Marine,[28] or strengthen defense industries.[29]

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[24] Committee on Banking, Housing and Urban Affairs, Subcommittee on Economic Stabilization, Catalog of Federal Loan Guarantee Programs, 95th Congress, First Session, September 1977, p. 62.

[25] According to Law, the use of Federal credit as an incentive to investment in specific industries or specific geographical areas could be valuable though at the time of his study (1963) this use had been largely unexplored. Law, op. cit.

[26] E.g., Academic Facilities Loan Insurance program.

[27] E.g., Construction and modernization of hospitals and other medical facilities guarantee program.

[28] E.g., The purpose of the Federal Ship Financing Guarantee program is "to promote the growth and modernization of the United States Merchant Marine by issuing guarantees of obligations to enable financing and refinancing of vessels constructed in the United States and owned and operated by citizens of the United States." Catalog of Federal Loan and Guarantee Programs, p. 72.

[29] E.g., the purpose of the Defense Production Act guarantee program "is to finance a contractor, subcontractor, or other person in connection with the performance of any contract or other operation deemed by the guaranteeing agency to be necessary to expedite production and deliveries or services under contracts for the procurement of materials or the performance of services for the national defense." Catalog of Federal Loan Guarantee Programs, p. 83.

Other programs are designed to capture valuable externalities in certain activities. If the expected benefits to society outweigh those to the individual, whether needy or not, insufficient resources will be allocated to that activity unless the government intervenes.[30]

Individual programs may possess one or several of the essential attributes described above. For example, one might argue that perfecting mortgage markets does not require stable mortgage credit flows: perfectly efficient markets may still be volatile. Yet stability of the housing sector is a primary goal of these perfecting programs.[31] In other cases, where the prime program objective is a reallocation of resources to pursue national political objectives, preference may be given to needy capital credit users or to borrowers in certain less developed geographical areas.

GROWTH STAGES

Over time, the emphasis and features of particular programs are likely to shift, reflecting changes in the nature of the required assistance and in the program's own development. Thus, a particular program may begin as an attempt to correct market imperfections by facilitating the flow of credit to particular users (e.g., mortgage credit). To do so, the program may have to design specialized credit instruments for borrowers (e.g., amortizing mortgages) as well as lenders (Federal insurance/guarantees). Initially, direct private participation may not be forthcoming, and the Federal involvement may have to be more direct through the supply of Federal loans, financed by Federal borrowing. Later, as the entrepreneurial and innovative elements become accepted, private intermediation can develop and the Federal intermediation can be phased out or "privatized." The growth in private intermediation may signify correction of market gaps. The Federal role may then shift in the direction of greater direct subsidy to "marginal" borrowers unable to compete for funds even in perfectly efficient markets, or to stabilizing the sector credit flows. Then, in the event private intermediaries encounter potentially catastrophic credit market conditions (e.g., intense disintermediation) the Federal role may expand to include emergency financial support to particular private business and nonbusiness organizations. Finally, even if there are no credit gaps, economically disadvantaged parties, or national or private emergencies, credit programs may still be used simply to encourage one type of activity over others, or to redistribute income in a manner similar to budgetary income transfer programs.

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[30] E.g. The Water Pollution Control Loans guarantee programs are intended "to assist small business concerns which are likely to suffer substantial economic injury caused by compliance with standards established by the Federal Water Pollution Control Act" Catalog of Federal Loan Guarantee Programs, p. 303.

Guaranteed Loans for Railroads in Reorganization (USRA) are intended "to pay off existing or prospective obligations of the railroads in reorganization to avoid disruption in ordinary business relationships. The loans can be used for claims of shippers, suppliers, and employees." Catalog of Federal Loan Guarantee Programs, p. 318.

Direct interest-free loans under the Small Reclamation Projects Act of 1956 were provided because "irrigators could not afford to borrow funds for construction and pay private interest rates . . . Thus, most of the projects needed were not being constructed." "A study of Federal Credit Programs," p. 256.

[31] "Since the mid-1969's the concept of the proper role of the federally sponsored housing credit agencies has changed radically. Stabilization of housing production has emerged as the principal operating objective." Gramley, quoted in Guttentag, p. 45.

Considering the mixture of program attributes and their tendency to change over time, any classification of programs by type is necessarily arbitrary. Nonetheless, credit activities may still be described according to their principal characteristics (see table 6). As of fiscal year 1976, market-perfecting programs represented more than 60 percent of all outstanding Federal credit, with income-redistributing programs representing about 25 percent, and priorities/externalities programs representing about 10 percent of all outstanding activity. The latter group, however, has been growing at a much faster rate than other types, averaging 25 percent per year during the 1969–76 period. Moreover, within the priorities/externalities group, loan guarantees averaged an annual growth rate of more than 200 percent per year, compared to direcct loans, which grew at about 20 percent per year.[32]

A second factor in the recent history of credit programs is the rapid growth of sponsored credit enterprises. While guarantee programs overall increased at an average 9 percent rate (due to their primary use in the slower-growing perfecting programs) and direct loan programs increased by 12 percent per year, sponsored activities increased by an average of 30 percent per year over the 1969–76 period. This was about twice the growth rate of non-bank thrift institutions and four times the growth rate of insurance companies.

TABLE 6.—FEDERAL CREDIT P ROGRAMS, DISTRIBUTION AND GROWTH, FISCAL YEARS 1969 TO 1976

[Dollar amounts in billions, fiscal years]

	Total outstanding, 1976	Average annual growth, 1969–76
Perfecting programs	$218.9	13
Guarantees	116.6	6
Loans	17.4	18
Sponsored agency	84.9	30
Income redistribution	86.8	9
Guarantees	58.8	13
Loans	28.0	3
Priorities/externalities	43.5	25
Guarantees	3.1	207
Loans	40.4	22
Total, credit programs	349.2	13
Guarantees	178.5	9
Loans	85.8	12
Sponsored agency	84.9	

Note: Sponsored agency activity is typically viewed as market-perfecting. Federal loans for this purpose include FHA-insurance claims; Export-Import Bank; FDIC; FHLBB; and SBA business and investment loans. The distribution of guaranteed loans among the 3 types follows that by Mitrisin, "Federal Loan Guarantees . . . ", April 1977. In fiscal year 1976, lending activities in the priorities/externalities group included international security assistance, international development assistance, Public Law 480, coastal energy impact fund, New York City, and transportation loans.

Source: Estimated by author from program descriptions.

B. Relationships to Budget Mechanisms

Credit programs differ fundamentally from standard budgetary programs in that they involve loans and repayments while typical budgetary outlays represent procurements or grants which are not

[32] This is consistent with Mitrisin's conclusion. These programs fall into his "type 3" category (aid to discrete ventures). "Type 3 guarantees are the most rapidly growing, increasing from $79 million in fiscal year 1960 to $3.1 billion outstanding in fiscal year 1976." "Federal Loan Guarantees and Their Use as a Mechanism to Correct Market Imperfections, Assist Marginal Borrowers, and Finance Discrete Ventures," Congressional Research Service, processed.

repaid. Still, strong similarities also exist. In particular, credit activities, like budget expenditures, reflect programmatic choices.[33] Indeed, the patterns of credit financing flows strongly resemble those of trust fund mechanisms, which are, of course, included in the budget totals. The use of the Federal Financing Bank and its growing importance to the financing of credit operations also links credit programs to the budgetary financing burden. Finally, the financing of credit programs may be a reduction of other budget outlays.[34] In each of these important ways, credit financing mechanisms can and should be considered in the context of standard fiscal policy. Considering the technical interchangeability of financing mechanisms which was previously discussed, these other relationships increase the importance of separating programmatic and financing choice decisions.

"PROGRAMMATIC" AND FINANCING DIMENSIONS

Viewed in a budgetary context, Federal credit programs possess programmatic and financing dimensions. Programmatic choices should be considered relative to alternative (credit or standard budget) choices. Given the interchangeability of financing (credit, tax incentive, grant) mechanisms, the use of credit devices should be examined with respect to cost-effectiveness relative to alternatives. In essence, the financing device should be a technical, neutral consequence of a programmatic decision; for example, to increase medical facilities or student enrollments, help Chrysler or restructure the rail industry or develop alternatives to oil-based fuels. Such a separation would be difficult to implement unless the volume and composition of financing (tax receipts, security issues) sources and mechanisms (outlays, loans, guarantees) are simultaneously determined. Otherwise, program choices will be influenced by the ease with which they can be financed through off-budget mechanisms. When a programmatic decision is linked to a financing mechanism, it should be explicitly recognized that the programmatic choice will reduce the remaining financing options. Currently, there is concern in Congress [35] and elsewhere that programmatic choices are following the financing mechanism rather than the other way around.

LOAN PROGRAMS AND TRUST FUNDS

Credit programs, like standard budget operations, are conduits which collect funds from the economic and financial systems through contributions, tax revenues, and security issues, and disperse them through loans, grants, and procurements. It is less important that budget outlays do not typically link the user of funds directly with the supplier the way that credit programs link repayments to borrowers than that the economy overall is both provider and user of funds. More specifically, lending activities operate as trust funds in

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[33] That is, "in which the government seeks to achieve social, economic, military, and other policy objectives which even a perfectly functioning market system would not achieve." Commission on Money and Credit, "Money and Credit: Their Influence on Jobs, Prices and Growth," p. 184.

[34] Break (1965) presented evidence of such non-debt program financing: ". . . postwar federal loans had some restrictive impact on other types of federal expenditures in every year except those dominated by the Korean War. Upward pressure may also have been exerted on tax rates, notably in 1954 and 1957." Break, "Federal Lending and Economic Stability," p. 81.

[35] See, for example, Congressional Budget Office, "Loan Guarantees: Current Concerns and Alternatives for Control," 1978, and Office of Management and Budget, "Federal Credit Programs" in "Special Analyses of the Budget."

reverse: cash is paid out (lent) to the recipient and subsequently paid in (repaid). Trust funds, of course, involve first a period of payments into the funds, followed by later disbursements. Net outlays, like budget deficits, are financed by drawing down liquid balances, or with security issues, or through congressional appropriations.

LOAN PROGRAMS AND TREASURY DEBT MANAGEMENT

On-budget net loan outlays clearly add to the budget deficit or reduce the budget surplus. In fiscal year 1978, for example, net outlays of on-budget credit programs added almost $9 billion to the budget deficit. Yet even this amount was net of loan sales to the FFB ($8.5 billion) and the public ($2.9 billion), which had the effect of reducing the net outlay of on-budget loan programs. Without the loan asset sales, the contribution of on-budget loan programs to the 1978 deficit could have been more than $20 billion, rather than the $9 billion shown. The fact that the other $11 billion was off-budget financing did not lessen the Treasury financing burden during 1978 (see table 7). While the budget deficit in 1978 required Treasury financing of almost $49 billion, the actual Treasury financing burden was in excess of $59 billion after inclusion of the off-budget net outlay activity in excess of $10 billion. Based on estimates by the Office of Management and Budget for fiscal year 1981, credit programs will not only result in the anticipated deficit for the year, but will add another $11.5 billion in increased Treasury financing activity during the year.

TABLE 7.—FINANCING BURDEN OF OFF-BUDGET ENTITIES
(IN MILLIONS OF DOLLARS)

	1978(A)	1979(E)	1980(E)	1981(E)	1982(E)
Budget surplus (deficit)	($48,839)	($37,379)	($29,013)	($1,216)	$37,758
Off-budget enterprises	(10,327)	(11,990)	(11,956)	(11,501)	(11,096)
Total surplus (deficit)	(59,166)	(49,368)	(40,969)	(12,711)	26,662

OFFSETS OF DIRECT LOAN ACTIVITY
(IN BILLIONS OF DOLLARS)

New transactions	$44.2
Offsets:	
Repayments	14.7
FFB purchases	8.3
Public sales	2.7
Adjustments	1.5
Total offset	27.2
Net, new outlays	17.0

Source: "Special Analyses of the Budget of the United States Government, Fiscal Year 1980," p. 106.

C. Impacts on Economic Variables

The central uncertainties relating to the economic effects of credit programs can be distilled into two basic, empirical, questions:

(1) Do credit activities of the federal government and its sponsored credit enterprises produce lasting alterations in the composition and volume of credit?

(2) Do alterations in the composition and volume of credit produce predictable changes in the allocation of economic resources?

If increases in federal credit flows to favored sectors are offset by decreases in non-federal credit flows to the same sector (lending displacement), federal credit programs will not influence the total volume of credit going to the favored sector; nor will such programs affect the overall volume of credit in the economy. Instead, the effect of the federal credit activity will be to "federalize" the credit going to the favored sector without otherwise altering the allocation of financial or economic resources and, hence, the level or composition of national income.

Furthermore, even if credit programs do not completely displace private lenders and thereby *do* increase the volume of credit flowing to a particular sector, there may still be no alteration of the level or composition of national income. Briefly put, this suggests that more mortgage credit does not result in more housing. Evidence on this important matter is discussed later.

NATIONAL INCOME

If credit activities result in (or are supported by) an increase in the volume of credit or, equivalently, a more intense use of existing credit, they will have an expansionary effect on the overall economy. In periods of high unemployment (such as the 1930's) any expansion of credit operations results in more economic activity (to the extent new demands are stimulated).

Credit programs have extended vast amounts of credit directly and indirectly through loans, guarantees and other subsidies. For example, we extimate that gross extensions of credit (i.e. before repayments) have exceeded $1.5 trillion in the past 25 years. Considered in isolation, the extensions of credit represent new spending, repayments represent reductions in spending. This is misleading, however, since a number of off-setting market reactions must be considered. With a given supply of money, the federal credit activities result in private displacements of lenders or borrowers ("crowding out") or both. When these displacements occur, there is little if any lasting impact on overall spending. However, if federal credit operations stimulate spending demands and if the money supply is also expanded, additional national income will result. Whether an expanded level of spending translates into inflated or real economic growth or any growth at all depends on the relative elasticities of sector outputs and the uses to which the credit is put.

The income-generating effects of federal credit programs, thus, depend crucially on the level of supportive monetary expansion. Since credit programs become more important to the sectors they assist during times of monetary restraint, the supportive role of the Feddral Reserve creates a policy dilemma. With respect to borrower displacement, it is important to recognize an important difference between credit-program crowding and deficit-financing of the budget crowding. Budget financing requirements are typically worst in periods of deep recession while the financing requirements of credit programs are heaviest during periods of high economic activity. Therefore, the probability of borrower displacement effects is substantially greater for credit than for budget financing.

INFLATION

At times of full employment or high resource utilization in favored sectors, an expansion of federal credit results in a rise in prices with little or no impact on real output. It should be noted that an overall inflationary effect can be produced even in the absence of monetary expansion. For example, if private borrower crowding out results from the increased federal support to a particular sector, a shift in the composition of spending will take place. The shift results in a sector price inflation in the favored sector which is not offset by a price deflation in the crowded out sector. Thus, in an increase in mortgage credit results in a decrease in business credit, more spending on housing and less on business activities will result. The increased demand for housing will be inflationary at high resource utilization levels. Unless off-set by a price deflation in the business sector, the overall effect of the credit activity will be inflationary.

If the credit activity is accompanied by a supportive increase in the money supply, the inflationary effect will be more severe since there will be no reduction in business spending.

OVERALL ECONOMIC STABILITY

Dependence on federal credit programs by favored borrowers increases during period of restraint. Thus, in their desire to assist particularly vulnerable sectors, credit programs expand their activities in a manner counter to the economic stabilization objectives of both monetary and fiscal policies.[36] In a period of restraint, the displacement effects noted previously become substantially heightened.[37]

PRODUCTIVITY

Through financial innovation and infrastructure developments credit programs have had an impressive record of accomplishments:[38] housing and agricultural credit markets and economies being clear examples. Through such devices domestic credit flows have been made more efficient. In other respects, however, credit programs have impeded efficiencies in both the financial and economic systems. In particular, the relative pricing of securities has been hampered by the interposition of federal credit. Credit programs currently are incapable of efficiently discriminating among investments on the basis of relative risk and productivity. When guarantees are involved, private investors have the same difficulty. There is currently no clear basis for determining whether credit or alternative mechanisms are most efficient in the pursuit of program objectives. Without a realistic measure of program costs, decisions with respect to the scale or composition of federal credit involvement will be difficult. Likewise, comparisons of relative costs and benefits of particular programs will not be possible.

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[36] Break, "The Economic Impact of Federal Loan Insurance," p.13.

[37] See Jaffe and Rosen, "Estimates of the Effectiveness of Stabilization Policies," Journal of Finance, June 1978, p. 944.

[38] Saulnier, et. al. considered the effects on financial institutions to be more important then either the aggregative or resource allocation effects on the economy. op. cit., p. 145.

INCOME REDISTRIBUTION

An important function of credit programs has been assistance to weaker borrowers who otherwise could not compete for credit. Both direct, low-interest loans and guarantees (enabling lower borrower costs) have been employed in this regard. Questions with respect to the actual distribution of costs and benefits of credit programs have been raised. For example, portfolio restriction policies reduce the costs of mortgages to home buyers. The cost, however, is shifted to depositors at thrift institutions or to deposits at other institutions.[39] Furthermore, even if programs successfully do shift resources to, say, increases in the housing stock, they still do not necessarily redistribute housing toward lower income groups, reduce slums or reduce racial discrimination in the housing market.[40] Likewise, it is not obvious that federal guarantees proportionately reduce the costs of financing to borrowers as they reduce lender risks. Nor is there reason to believe that federal concerns are safeguarded by either private borrowers or lenders in the transaction. A further and well-recognized possibility is that federal participation reduces the emotional as well as financial commitments to the arrangement and precipitates defaults earlier than otherwise or than desirable.

SECTOR INCOME

Because of the great variety of offsetting effects triggered by the expansion (and contraction) of federal credit activities, it is inappropriate to base conclusions about credit activities solely on the scale of federal program activity. In short, little can be said about sector impacts of federal credit programs without information about the supportiveness of monetary policy or the nature of private displacement effects created by the credit programs. Displacement effects, in turn, depend importantly on the efficiency of credit markets, the extent and character of federal regulation and the relative sensitivities of borrowers to rising interest rates.

Generally, sector spending will be influenced most strongly by credit programs when there is a supportive expansion in the money supply or when there is borrower displacement. Whether the increase in sector credit use translates into greater sector income depends on whether the greater credit usage results in greater sector demand. For example, whether greater mortgage credit results in greater housing demands.

D. Impacts on Private Decisions

Federal credit programs have a number of recognized and undesirable impacts on private decision-making in both the economic and financial areas. Five such impacts are discussed in this section:

(1) Displacement of private lenders.

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[39] Silber, in Kaminow and O'Brien, eds., "Studies in Selective Credit Policies," 1975, pp. 117–8.

[40] Kaminow and O'Brien, "Issues in Selective Credit Policies," in Kaminow and O'Brien, eds., op. cit. p. 5.

(2) Displacement of private borrowers.
(3) Encouragement of foreign financing.
(4) Creation of public policy "wedge" in private decisions.
(5) Preservation of large, inefficient organizations.

PRIVATE DISPLACEMENT

With a fixed money supply, credit program expansions have the effect of displacing private lenders and/or borrowers. If securities markets are relatively efficient, the dominant effect is likely to be a displacement of lenders and/or financial disintermediation.[41] [42] Where financial markets are segmented or regulated, the displacement is more likely to bear on private borrowers. Private lenders are displaced if federal programs significantly alter relative yields and credit is mobile. The favored sector will reflect a reduction in relative yields. Private lenders will shift out of the favored sector towards the higher yields in other sectors.[43] If lender displacement does not occur the volume of credit flowing to the favored sector will increase. Without monetary expansion, crowding out of weaker borrowers will occur.[44] This reallocation of credit is most likely to occur when the favored sector is characterized by weak or non-existent credit institutions or portfolio regulation.

Three consequences suggest themselves with respect to this displacement effect: (1) If displacement of borrowers and/or lenders is to be avoided, the monetary aspects of credit programs in general are crucial. Otherwise, some form of mandatory credit allocation is necessary. (2) Private lending institutions may be permanently disdisplaced or financially weakened by recurring episodes of displacement. Short of this, private institutions are directly coerced into augmenting federal credit programs (as an attempt to circumvent the displacement of lenders). (3) There is a tradeoff involved between lender and borrower displacements. Without an expansion in money supply, the displacement of lenders reduces the displacement effect on borrowers, and vice-versa. The reason being that displaced lenders will redirect credit flows to other borrowers, thus reducing the borrower displacement. Conversely, if borrowers are displaced, less lender displacement takes place.

Where displacement of borrowers is involved, a number of other consequences are possible: (1) Domestic credit flows will be increasingly federalized, injecting federal involvement in more and more of national output; (2) the probability that uncoordinated credit programs will impede the attainment of budget priorities will increase; (3) business firms will be forced to increase reliance on foreign credit

[41] "The channels thrcugh which credit flows to housing can be changed, but the total flow is unlikely to be influenced. New regulations and modifications cf existing cnes may well influence the portion of housing sales that nonbank thrift institutions finance, but additions to funds through their channel are likely to promote withdrawal of funds from other channels." King, op. cit. p. 58.

[42] "FHLB bonds are a substitute for savings at SLAs in investors' portfolios; hence sales of FHLB bonds in the open market have a reverse effect on Net New Savings." Kwcn and Thornton, "An Evaluation of the Competitive Effect of FHLB Open Market Operations on Savings Inflows at Savings and Loan Associations," Journal of Finance, June 1971, p. 708

[43] "The most obvious impact of the agencies has been the reduction in the home mortgage rate relative to other rates and the consequent shift of discretionary investors-life insurance companies, private pension funds and mutual savings banks to some extent, out of the home mortgage market." Hendershott and Villani, *op. cit.* p. 45.

[44] Break considered this to be the most important policy effect. "The Economic Impact of Federal Loan Insurance." p. 14.

sources (possibly shifting real investments overseas as well); (4) demands from other sectors for federal credit protection will increase; or (5) pressure will grow for central planning of national output in order to systematically determine which sectors will be expanded and which will not be encouraged.

The monetary aspect of credit activities is not clearly recognized and, consequently, the undesirable regulatory and displacement consequences have not been fully appreciated. Yet, there is little question but that faced with a choice between displacement and monetary expansion, the latter will be emphasized.

E. Impacts on Budget Control

The fact that credit activities are, for the most part, "off-budget" does not diminish their importance to budgetary decisions. To the extent credit programs are interchangeable with non-credit budget outlays, credit programs are a tempting "backdoor" financing device. Additionally, the Treasury financing burden is affected by net outlays of both on-budget and off-budget loan programs. The budget totals are affected by on-budget net loan outlays. All credit programs are characterized by very substantial errors in estimation even when budget-year estimates are considered. Furthermore, there is substantial variation in practice with respect to the accounting and recognition of defaults, leading to potentially serious understanding of losses.[45] Finally, there is no satisfactory procedure for measuring the level of subsidy or value transfer contained in alternative credit arrangements. All of these considerations impact on budget control and warrant greater security.

"BACKDOOR" FINANCING

The main concern relative to lack of congressional control of federal credit activities relates to the absence of an integrative, comparative consideration of program alternatives. To some, important, extent this is a technical problem, for there is currently no feasible way of comparing, for example, $1 billion in loan guarantees with $1 billion of direct loans or direct outlays. Loan guarantee and insurance programs are specifically exempted from the Congressional Budget Act.[46] In a number of instances, credit programs are inherently in conflict with one another and may collectively conflict with overall fiscal policy objectives (and monetary policy objectives). Transactions of the Federal Financing Bank have the effect of obscuring individual credit operations and possibly concealing the real scale of particular programs by loan asset purchases and the Treasury debt management burden. Reliance on credit mechanisms will increase as public pressure on budget outlays and balanced budgets increases. Programs may possess "entitlement" aspects which make the level of activity relatively volatile and uncontrollable. Estimating experience has not been good. Even budget year estimates have proven to be substantially under as well as over actual.

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[45] "Some loans that have actually defaulted are still carried on the government's books because the government does not wish to legitimize the default. World War I loans to the U.S. allies, for example, are still carried on the government's books although no other government recognizes them. And some loans do not go into default because the loans are refinanced by the lending agency." Larkins, "$300 Billion in Loans," 1972.

[46] "(Authority) does not include authority to insure or guarantee the repayment of indebtedness incurred by another person or government." Sec. 401(c)(2), Congressional Budget Act.

BUDGET BALANCE

By fiscal year-end 1979, almost $500 billion in federal credit will be outstanding. By comparison, total budget outlays are expected to be $466 billion. Budget outlays are projected to increase by $26 billion between 1978 and 1979. This compares with an estimated increase in federal credit activity of $53 billion, or more than twice as much. The anticipated deficit for fiscal year 1979 is about $37 billion, of which $5 billion represents on-budget credit programs; and, another $12 billion represents net lending by off-budget agencies. However, since a substantial portion of the off-budget lending represents purchases by the FFB of on-budget loans, the potential impact on the budget deficit is larger. Among credit programs, the most dramatic growth will be in guaranteed loans (net increase) which are estimated to increase by 85% during 1979, compared with a decline of 42% for new on-budget lending and 44% decline for new sponsored agency lending.

ESTIMATING ERRORS

Budget year estimates have been completely unreliable with respect to the net change in overall credit and, especially, activities of particular types of credit programs. For example, the actual change in net guaranteed activity in FY 1977 proved to be almost 6 times that contained in the budget-year estimate. Actual direct lending in 1975 turned out to be almost 6 times as great as the amount estimated. Meanwhile, in 1971, the estimate of net sponsored loans turned out to be 5 times as great as actual. Between 1968 and 1978, the estimate for direct loans was off by over 100% in 4 out of the 10 years, and in all cases the estimate was below the actual (see table 8).

TABLE 8.—PERCENT DIFFERENCE BETWEEN ACTUAL OUTLAYS AND INITIAL ADMINISTRATION ESTIMATES, AGENCIES AND MAJOR PROGRAMS

	1973	1974	1975	1976	1977
Farmers Home Administration	−300.6	81.4	−88.5	9.4	152.6
FHA fund	87.6	−69.5	10.9	38.7	−68.7
GNMA special assistance	−221.9	33.3	100.1	41.5	−118.1
Export-Import Bank	−92.2	−20.7	16.9	−105.3	−284.1
FHLB Board	−13.7	−13.2	136.1	302.5	−80.0

Source: Congressional Budget Office, "Estimates of Federal Budget Outlays," February 1978.

The budget impact of estimating errors has been noted in a recent Congressional Budget Office study.[47] Guaranteed loan activity has also been mis-estimated, though predominantly over-estimated. In 1970, the estimate was 10 times greater than actual. Mis-estimates exceeded 100% in 4 of the 10 years (see table 9). Similarly the error rate with respect to sponsored activity exceeded 100% in 4 out of ten years. Additionally, error rates are extremely volatile. In 1977, for example, actual guarantee activity was 6 times that estimated, but the following year, actual was only about half the estimated amount.

[47] Congressional Budget Office, "Estimates of Federal Budget Outlays," February 1978.

TABLE 9.—NET CHANGE IN CREDIT EXTENDED, ACTUAL VERSUS BUDGET-YEAR ESTIMATES

Fiscal year	Total	Loans	Guarantees	Sponsored agency
1969:				
Actual	$15.0	$2.9	$7.8	$4.3
Estimated	16.4	4.6	10.0	1.8
Actual/Estimated	0.9	0.6	0.8	2.4
1970:				
Actual	17.4	4.5	2.3	10.6
Estimated	26.5	1.4	20.5	4.6
Actual/Estimated	.7	3.2	.1	2.3
1971:				
Actual	16.5	3.0	12.2	1.3
Estimated	22.3	1.6	12.5	8.2
Actual/Estimated	.7	1.9	1.0	.2
1972:				
Actual	22.8	2.9	15.6	4.3
Estimated	31.4	2.7	24.5	7.9
Actual/Estimated	.7	1.1	.6	.5
1973:				
Actual	26.7	1.0	14.0	11.6
Estimated	33.8	.7	31.8	11.3
Actual/Estimated	.8	1.4	.6	1.0
1974:				
Actual	26.9	4.4	6.2	16.3
Estimated	26.9	.9	13.8	12.2
Actual/Estimated	1.0	4.9	.5	1.3
1975:				
Actual	26.9	12.8	5.7	8.5
Estimated	16.8	2.3	11.0	3.5
Actual/Estimated	1.6	5.6	.5	2.4
1976:				
Actual	26.6	10.9	10.3	5.4
Estimated	28.7	12.3	7.7	8.7
Actual/Estimated	.9	.9	1.3	.6
1977:				
Actual	36.6	11.6	14.1	11.0
Estimated	31.2	12.1	2.4	16.7
Actual/Estimated	1.2	1.0	5.9	.7
1978:				
Actual	59.0	19.8	11.3	27.9
Estimated	45.5	10.0	21.2	14.3
Actual/Estimated	1.3	2.0	.5	2.0

Source: Office of Management and Budget, Federal Credit Programs, "Special Analyses of the Budget," various issues.

IDENTIFICATION OF CREDIT SUBSIDIES

Currently, there is no objective, agreed upon way of valuing the subsidy element of federal credit participation. While the Office of Management and Budget has prepared estimates of interest rate subsidies for major programs (totalling roughly $80 billion in the last 10 years alone), even these estimates vary substantially depending on the (unknown) private rates which would have been paid without the federal involvement. There is the further difficulty that for perfecting credit programs, where credit gaps are involved, there is no comparable private rate. Still the assessment of actual costs of programs is crucial to the efficient use of federal credit programs. Moreover, the costs of federal credit involvements must be viewed more broadly than simply covering Treasury financing costs and origin and loan servicing costs. In most cases, the value transferred will exceed these costs. On the basis of OMB's estimates, the total subsidy value during the past 10 years of direct lending and guarantee activity has exceeded $80 billion.

VI. Review of Empirical Work

Looking at the benefits of programs, market-perfecting programs should have no implicit or explicit benefits; income redistributing programs should have benefits primarily linked to users (e.g., low

interest rates); externality/priority programs should have incentives linked to investors. In other words, market-perfecting programs make market rates "available" to those able to pay for them; redistributing programs help pay market rates; and externality/priority programs offer above-market returns.

Despite the importance of the issues raised by Federal credit programs, little empirical work has been done in this area. And that which exists does not provide a firm basis for conclusions. Studies of credit activity generally have reached different conclusions depending on their underlying assumptions. For example, studies looking only at the primary effects of credit programs, and ignoring feedback and displacement effects created by the credit programs, offer much more optimistic conclusions. More comprehensive studies that consider offsetting reactions from the financing of the credit activity, however, find almost no lasting impacts on major economic variables.

A. Complexities

Analyses of credit activities must deal with a number of important complexities. For example, there are significant, generic differences in purposes among programs, with different consequences for their impacts on real and financial variables. Credit programs directed at the correction of market imperfections should have different effects from programs directed toward the assistance to marginal borrowers or the financial restructuring of financially impaired ventures. Moreover, programs experience growth stages which alter the degree and diffusion of impacts. For example, the impact of financial innovations in early mortgage credit programs differs substantially from the current effects of such programs. Thus, the significance of particular programs depends on their stage of development. For example, proving that the mortgage insurance and secondary markets for mortgage investments are profitable activities completely dwarfs any other accomplishment of Federal mortgage programs.[48] A third empirical difficulty is that the financial and real effects of particular credit market involvements have complicated, lagged patterns, which are properly evaluated only with comprehensive econometric models. Yet the level of aggregation makes it virtually impossible to disentangle effects of all but the largest programs. Thus, the collective impacts of credit programs may never be revealed, or even suggested, by the analysis of individual programs.

A fourth difficulty is that program data bases from which empirical research can be developed are inadequate except in the oldest and largest programs. Thus, generalizations regarding relatively small, newer, generically distinct programs are at best tentative. A further difficulty is that a program's short-run effects differ substantially from its long-run effects depending on the speed and extent of market adjustments to the Federal credit interventions. Finally, the effects of credit programs depend to a large extent on the character of overall financial and economic conditions and the simultaneous actions of monetary and fiscal policy.

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[48] Larkins, for example, notes "If FHA had never existed, it is far from clear that private lenders would have developed amortizable mortgages on their own, and it is virtually certain that they would not have done so at the time that FHA did," p. 15.

B. Evidence

In general, earlier studies of credit programs were more optimistic about their effect on resource allocation than recent studies. For example, Saulnier, et al., concluded that significant resource shifts occurred in agriculture, particularly during the 1930's, and that this led to increased supply of farm products without commensurate increases in demand, resulting in reduced farm income. With respect to private business activities, no overall effects were observed due to the relative insignificance of Federal credit compared to all business credit flows to that sector. But they found significant effects in particular types of business firms and industries.

This paper discusses eight studies (see table 10) which relate the effects of specific or total credit activity to aggregate economic variables. The first studies, published between 1958 and 1965, considered only the primary effects of the credit programs and did not incorporate the variety of offsetting financing and portfolio adjustment reactions of private markets. The latter four studies, published between 1973 and 1978, in contrast, specifically incorporated the various offsets directly into their models. Consequently, the latter studies have produced conclusions substantially at odds with the earlier studies regarding most aggregate, long-run effects. Some agreement among the various studies, however, does exist with respect to short-run effects. The following section summarizes the major findings of these studies.

NATIONAL INCOME

A 1958 study by Saulnier, Halcrow and Jacoby, covering the period 1917–53, examined loans, insurance, guarantees, and activities of sponsored agencies. According to this study, the effects of Federal credit activity could be approximated by the net change in such activity. Thus, an increase in net credit extended under Federal auspices was interpreted as similar to an expansion in budget outlays, while a decrease in net credit was similar to a reduction in budget outlays. During the entire period, the Saulnier, et al. study found an important income-generating effect only in the depths of the Depression during the 1930–35 period. In all other years, the effects of Federal credit programs were either relatively unimportant (1917–30; 1936–46) or primarily inflationary (1947–53) with respect to national income.

TABLE 10.

A. INCOME GENERATING

1. *Saulnier, et al.* (1958)
   Period covered: 1917–53.
   Type of credit analyzed: loans, insurance, guarantees, sponsored agencies.
   Measure of impact: net credit extended.
   Findings.—1917–30, relatively unimportant in overall spending; 1930–35, increasingly important in expanding spending; 1936–46, relatively unimportant in overall spending; and, 1947–53, moderate (inflationary) impact on GNP.

2. *Law* (1963)
   Period covered: 1929–58.
   Type of credit analyzed: loans, insurance, guarantees, sponsored agencies.
   Measure of impact: net credit extended.

Findings.—1929–34 insignificant in income generating potential; 1934–36, small, positive impact on income; 1942–45, no impact on income; 1946–48, important (inflationary) impact; 1949–50II, important stimulus to real output; 1950II–53, small (inflationary) impact; and 1954–58, moderate to insignificant impact.

3. Break (1961)

Period covered: 1935–59.
Type of credit analyzed: insurance and guarantee programs.
Measure of impact: net change in credit outstanding.
Findings.—1935–46 typically minor and erratic (expansionary and contractionary); 1947–53 moderate expansionary impact on overall spending; and 1954–59 increasingly important in overall spending.

4. Break (1965)

Period covered: 1946–63. *Type of activity:* Federal lending.
Measure: net change.
Results.—1947, strong, positive effect; 1948–57, generally small positive and negative effects; and 1958–62, generally moderate impacts.

B. STABILIZING

1. Saulnier, et al.

Results.—stabilization record generally more appropriate than those of budget and monetary policies.
Net credit increases five times out of seven.
Net credit declined nine times while GNP increased 17 times.
Change in net credit concurrent with fiscal policy 22 of 36 years.
Change in net credit concurrent with monetary policy 12 of 36 years.

2. Law

Results.—stabilization record appropriate in 16 of 29 years.
Credit activity consistent with fiscal policy 18 of 29 years.
Credit activity consistent with monetary policy 18 of 29 years.

3. Break (1961)

Results.—Net volume of loan insurance had appropriate sign in five out of 12 years.
Loan insurance programs consistent with fiscal policy in six out of 13 years.

4. Break (1965)

Results.—Changes in amounts of direct loans outstanding had the appropriate sign in seven of 16 years.
Change in loans outstanding consistent with budget changes in seven of 16 years.

C. INCOME DISTRIBUTION

1. Saulnier, et al.

Results.—In agriculture, main result was to expand supply of agricultural output, lower commodity prices and reduce farm incomes.

2. Law

Results.—It is doubtful that income was redistributed downward. Business sector assistance improved the positions of stockholders. Housing programs assisted middle income groups. Agricultural programs mainly benefited large farmers (through price supports).

D. SECTOR OUTPUTS, PRICES, STABILITY

1. Saulnier, et al.

Results.—Agriculture—more output, lower prices. Housing—more of an impact on prices than output. Business—significant only in special areas.

2. Law

Results.—Agriculture—helped produce agricultural revolution. Housing—little question of effectiveness. Business—important in specialized areas.

3. Break (1961)

Results.—In housing, loan insurance programs provided an important stimulus to the residential construction industry averaging between $2 and $4 billion per year (in constant dollars).

E. SIMULATIONS

1. Duesenberry/Bosworth (1973)

Period simulated: 1965–70.

Type of credit analyzed: FNMA mortgage purchases of $1 billion in 1965.

Measure of impact: Difference between actual and simulated levels of variables.

Findings.—Nominal GNP $200 million higher at end of simulation. Residential construction is $100 million higher. Savings and loan deposits are $600 million lower. Life insurance companies hold $500 million less in residential mortgages by the end of the simulation. Conventional mortgage rate is 3.4 basis points lower. Short-run effects can be substantial but long-run effects are minor.

2. Dusenberry/Bosworth (1974)

Period simulated: 1969–71.

Type of activity: FNMA purchases are frozen at 1969 level. A reduction of $10.1 billion between 1969 and 1971.

Measure of impact: Actual vs. simulated levels of variables.

Findings.—GNP is only $400 million below actual by the end of 1971. Residential construction is only $600 million below actual. The mortgage rate is 10 basis points below actual. Residential mortgage stock is $3.1 billion below actual. Non-bank intermediary deposits are $6.1 billion higher. Short-run effects can be substantial but they get "unraveled" by the market adjustment mechanism. Long-run effects are minor.

3. Hendershott (1977).

Period simulated: (a) 1969; (b) 1965–71.

Type of activity: (a) $1 billion FSCA mortgage purchases; (b) reduction of $18 billion in mortgage purchases to 1965 level.

Measure of impact: Actual vs. simulated levels of variables.

Findings.—(1) strong short-run effects. Decrease in mortgage rate by 19 basis points in first quarter. Mortgage stock increased $450 million by fourth quarter. Housing stock increased by $510 million in fifth quarter. Only slight long-term effects. Eleven quarters after the purchase, mortgage stock is only 5 basis points lower, mortgage stock only $60 million higher. Housing stock only $230 million higher.

(2) withdrawal of $18 billion of mortgage credit activity would have raised the mortgage rate by 106 basis points. Mortgage stock at end or simulation was $3 billion lower. Housing stock was $4.5 billion lower in the simulation.

4. Jaffee/Rosen (1978)

Period simulated: 1965–76 monthly.

Type of Credit Activity: $18 billion increase in agency commitments and interest rate subsidies during rationing and non-rationing periods.

Measure of impact: Difference between actual and simulated levels of variables.

Findings.—Although long-run effects disappear, mortgage credit programs can and do have substantial and rapid short-run effects. These effects increase during periods of credit rationing. An $18 billion increase in FNMA purchases results in 62,000 additional housing units in non-rationing environments versus 101,000 units in rationing environments. Therefore sectoral stabilization can be effective.

A similar study by Law (1963) done for the Commission on Money and Credit covered the 1929–58 period. This study examined all types of Federal credit and like the earlier study, focused on net credit extended: increases being viewed as income-generating, decreases as income-reducing. In contrast to the Saulnier study, the Law study found only a small positive impact on income in the 1934–36 period and an insignificant impact on income prior to that. Law came to a different conclusion by determining that the large increases in credit during the Depression were primarily directed at strengthening financial institutions and were not primarily income-generating. Law concluded that the effect of Federal credit activity was inflationary between 1946 and 1953, except for the 1949 to 1950II (second quarter) period. In this respect, Law's conclusion was similar to the Saulnier study for the post-war period. Law decided that the 1949–1950II period was the only important stimulus to real output.

Two works contain Break's analysis of Federal credit activities: a 1961 study covering the period 1935–59, which examined insurance and guarantee activities, and a 1965 study covering the period 1946–63, which examined lending activities. Like the two earlier studies, Break's research focused on the net changes in insurance and guarantee activity and also in direct lending. Break's earlier study indicated a growing importance over the 1935–59 period of guarantee and insurance activity in income-generating effects. Prior to 1947, however, the impact was typically minor and erratic (both expansionary and contractionary). Break's study of lending activity indicated a strong, positive impact only in 1947, with generally small positive and negative effects in the 1948–57 period, and moderate impacts in the 1958–62 period.

All of the comprehensive studies recognized, but did not adjust for, the importance of the financing offsets required by the credit activity. The studies recognized that these offsets were large enough to reverse completely the stimulative or contractionary impacts on national income produced by the credit programs.[49] These early studies, however, did not have available a methodology suitable for handling the complicated reaction patterns in the private markets.

In 1973, Duesenberry and Bosworth presented a model incorporating the feedback effects of Federal credit activities. The model was based on a flow-of-funds framework and used simulation of alternative policies and program activities to evaluate the actual results. The Duesenberry/Bosworth simulation looked at only one type of credit activity: mortgage credit. The model was based on the 1965–70 period and simulated the effect of a $1 billion increase in FNMA mortgage purchases. The results showed a strong, immediate impact on GNP which quickly dissipated. Eighteen months after the initial purchase by FNMA, GNP was actually lower because of the intervention by FNMA. The GNP effect stayed negative until the first half of 1970. At the end of the simulation period—the end of 1970—GNP was about $300 million higher as a result of the $1 billion FNMA purchase. Over the entire simulation period, the net impact on total GNP is a reduction by $1.5 billion as a result of the $1 billion purchase by FNMA. By the second half of 1970, residential construction is only $100 million, annual rate, higher than it would have been without the $1 billion in FNMA purchases. Duesenberry and Bosworth concluded that short-run effects of FNMA purchases could be substantial, but they were reversed in the longer run through market reactions to the Federal stimulus.

In 1974, Duesenberry and Bosworth again simulated FNMA activity (see table 11). This time the period covered by the simulation was 1969–71, a period of credit restraint. The study examined the impact of freezing FNMA purchases at the 1969 level, thus eliminating the impact of more than $10 billion in FNMA purchases over the period. By the end of the simulation period, GNP was only $400 million below actual, even though FNMA mortgage purchases were $10.1 billion below actual. The mortgage stock was only $3.1 billion

[49] "The scope of fiscal offsets available to the federal government is clearly a wide one. At one extreme, by resorting to money creation, it may impose an offset to all and allow the loan program to exert its maximum expansionary pressure on the economy. At the other extreme, by cutting back its purchases of new output to make an equal amount of new loans, it may well more than offset the expansionary effects of those loans and end up with a new deflationary impact." Break, "Federal Lending and Economic Stability", p. 21.

below the actual level by the end of the simulation. Importantly, nonbank intermediary deposits were $6.1 billion higher. As in their earlier study, Duesenberry and Bosworth indicated that short-run effects can be substantial but they get "unraveled" in the longer run by the market adjustment mechanism. Long-run effects are minor.

TABLE 11.—CHANGES IN SELECTED VARIABLES FOR A REDUCTION IN FEDERAL NATIONAL MORTGAGE ASSOCIATION MORTGAGE HOLDINGS

Variable	Semiannual periods					
	1969:1	1969:2	1970:1	1970:2	1971:1	1971:2
Interest rates:[1]						
Treasury bill rate	0	−0.17	−0.34	−0.36	−0.32	−0.43
BAA bond rate	0	−.04	−.13	−.19	−.26	−.37
Mortgage rate	0	.06	.01	−.08	−.11	−.10
Flow variables:[2]						
GNP	0	−3.4	−6.0	−5.0	−1.8	−0.4
Residential construction	0	−1.4	−2.0	−.9	0.1	−0.6
Business investment	0	−.5	−1.0	−1.1	−0.6	−0.1
Stock variables:[3]						
FNMA mortgage holdings	0	−2.0	−4.7	−6.3	−7.4	−10.1
Residential mortgage stock	0	−1.9	−3.5	−3.3	−2.7	−3.1
Time deposits	0	1.4	3.9	3.9	3.1	3.9
Commercial bank earnings assets	0	0	.5	.2	.2	.5
Nonbank intermediary deposits	0	.2	1.2	2.6	4.1	4.1
Long-term securities outstanding	0	.3	.9	1.5	1.8	2.2
Short-term securities outstanding	0	−2.0	−4.1	−5.1	−5.7	−8.4
Federal Government securities	0	−1.8	−3.4	−3.7	−3.8	−6.1
Household security holdings	0	−1.2	−3.3	−5.0	−6.1	−8.1

[1] Interest rates are measured as percentages.
[2] Flow variables are measured at annual rates in billions of dollars.
[3] Dollar stocks are measured in billions of dollars.

Source: Duesenberry and Bosworth, "Policy Implications of a Flow of Funds Model," Journal of Finance (June 1974) p. 344.

In 1977, Hendershott reported a simulation of the 1969 period (see table 12), examining the impact of a $1 billion increase in sponsored agency holdings of home mortgages. Like others, Hendershott found an early though rapidly diminishing impact on a number of market variables such as interest rates, mortgages, and housing.[50] [51] After 11 quarters, the initial infusion of $1 billion had resulted in a net increase in the housing stock of $230 million and a negligible impact on the mortgage stock. The study concludes that "Agency demand has simply substituted for private demands, especially that of mutual savings banks and life insurance companies."[52]

In the same study, Hendershott also simulated a freeze on sponsored agency purchases of mortgages at the 1965 level. He then examined the 1966–71 period with mortgage purchases frozen at the 1965 level (see table 13). The total reduction simulated during the 6 year period was $17.9 billion. The increase in sponsored agency holding which actually took place during the period (i.e. $17.9 billion) raised the total stock of mortgages by only $3 billion and the housing stock by only $4.5 billion.

[50] "Empirical evidence now has been accumulated showing that the agencies, in fact, have essentially no effect on mortgage and housing markets over extended periods; beyond, say a year, private sector reactions do fully offset the intervention of the agencies." Jaffee and Rosen, op. cit., pp. 933–4.
[51] ". . . the more recent the period analyzed, the more likely the research has been to find little or no effects of credit supply on housing beyond those explained by interest rates." King, op. cit., p. 56.
[52] Hendershott, "A Flow of Funds Financial Model" (1977), p. 238.

TABLE 12.—IMPACT OF A BILLION DOLLAR 1-TIME INCREASE IN FSCA HOLDINGS OF HOME MORGTAGES[1]

	Mortgage yields	Commercial paper yields	Corporate bond yields	Sponsored agency demand for mortgages	Housing stock
1(691)	−0.19	0.04	−0.01	0.64	0
1+1	−.13	.03	−.00	.74	.08
1+2	−.10	.07	−.01	.80	.22
1+3	−.07	.04	−.01	.86	.36
1+4	−.05	.07	−.01	.90	.47
1+5	−.05	.04	−.01	.90	.51
1+6	−.04	.04	−.01	.91	.49
1+7	−.06	.03	−.01	.89	.40
1+8	−.06	.02	−.01	.88	.30
1+9	−.06	.04	−.01	.88	.25
1+10	−.06	.02	−.01	.89	.24
1+11	−.05	.04	−.01	.90	.23

[1] Adapted from Hendershott, "A Flow of Funds Financial Model, 1977," p. 237.

Note: Interest rates in percentage points, dollar magnitudes in billions, housing flows at quarterly rates.

TABLE 13.—CUMULATIVE IMPACT OF APPROXIMATE FREEZE IN FSCA MORTGAGE HOLDINGS AT END 1965 LEVEL[1]

	Observed 714	Policy impact	Difference
Interest rates			
Commercial paper yields	5.03	0.67	4.36
Corporate bond yields	7.64	−.19	7.83
Mortgage yields	7.82	−1.06	8.88
Home mortgages and housing:			
Mortgage demand:			
Agencies	20.9	17.9	3.0
Savings institutions	177.3	−7.8	185.1
Other finance	35.2	−7.0	42.2
Commercial banks	48.0	−.1	48.1
Mortgage supply (households)	296.1	3.0	293.1
Cumulative impact on housing	73.8	4.5	69.3

[1] Adapted from Hendershott, "A Flow of Funds Financial Model," 1977, p. 240.

Note: Interest rates in percentage points, dollar magnitudes in billion, housing flows at quarterly rates.

OVERALL STABILIZATION

The four early studies of federal credit activity considered the stabilization record of credit programs by looking at the net change in credit activity relative to economic conditions and relative to fiscal and monetary policies. For example, Saulnier, et al. (1917–53) found that the stabilization record was generally more appropriate than those of budget and monetary policies. In 17 years of increasing GNP, federal credit programs declined 9 times. Saulnier, et al. considered this behavior to be appropriately countercyclical. Additionally, during 7 years of decreasing GNP they found "appropriate" increases in net credit in 5 of the years. Law later, properly, criticized this simplistic decision rule since it suggested that during the Depression even a slight increase in GNP would have called for a decrease in credit activity.

The Saulnier study also compared the net change in credit activity with the apparent fiscal and monetary policies being pursued. This focused on the extent to which credit "policy" was consistent with other stabilization instruments. The Saulnier study found that net credit changes were concurrent with fiscal policy changes in 22 of the 36 years and concurrent with monetary policy in 12 of the 36 years.

Law also examined the stabilization and coordination records of credit activity. In contrast to the Saulnier study, Law used a combination of the unemployment rate and the change in the Consumer

Price Index to indicate the need for expansionary or contractionary credit activities. Law found that credit programs had an appropriate change in 16 of 29 years between 1929 and 1958. The record of coordination with other stabilization policies was also favorable, being consistent with both fiscal and monetary policies in 18 of 29 years.

Break (1969) used a similar approach although he employed National Bureau of Economic Research data to characterize economic conditions. He found that the net volume of loan insurance had the appropriate sign in 5 out of 12 years and that loan insurance programs were consistent with fiscal policy in 6 out of 13 years during the 1935–59 period. Break's 1965 study of direct lending found that this credit activity had the appropriate sign in 7 out of 16 years, and the change in loans outstanding was consistent with budget changes in 7 out of 16 years during the 1946–63 period.

All of these have revealed the presence of strong short-run effects resulting from significant alterations in credit activity, regardless of the long-run impact. Thus, it it not surprising that a 1978 simulation by Jaffee and Rosen produced similar effects. Their simulation, however, used monthly data to track the short-run effects as carefully as possible. Jaffee and Rosen further examined the short-run effects under two types of credit environments: a rationing and a non-rationing period. Along with other policy simulations, they explored the effects of an $18 billion increase in FNMA mortgage commitments under both types of credit market conditions. Jaffee and Rosen concluded that although long-run effects disappear, mortgage credit programs can and do have substantial and rapid short-run effects. These effects increase during periods of credit rationing.[52a] For example, an $18 billion increase in FNMA purchases resulted in 62,000 additional housing units in the non-rationing environment versus 101,000 units in the rationing environment. Since Federal credit activities are particularly important during periods of credit rationing, the Jaffee/Rosen study demonstrates the important role in sectoral stabilization that credit programs can perform.[53]

While credit programs can have substantial short-run effects, they also trigger offsetting market adjustments. Thus, the use of credit programs for stabilization purposes can initiate undesirable reactions which are hard to predict or even control.

INCOME REDISTRIBUTION

Information is generally lacking in this area, but the available evidence is not favorable to credit programs. The Saulnier study concluded that in agriculture the main result of credit programs was to expand the supply of agricultural output without increasing demand commensurately, thereby reducing commodity prices and farm incomes.

Law doubted that credit programs redistributed income downward. Business sector assistance improved the position of stockholders. Housing programs assisted middle income groups. Agricultural programs, through price supports, mainly benefited large farmers.

[52a] Silber found that selective credit policies have their greatest potential usefulness within a cyclical context due to the delayed market reaction. Silber, op. cit., p. 109.

[53] "The counter-cyclical activities of federal mortgage agencies are . . . effective in stabilizing housing activity and mortgage market activity." Jaffee and Rosen, op. cit., p. 945.

Hendershott analyzed the redistributive effects of his second policy simulation which was discussed earlier (i.e., in which sponsored agency purchases were frozen at the 1965 level, resulting in a reduction of $17.9 billion in purchases by the end of 1971). As of the end of 1971, net interest income of $3.4 billion had been redistributed (see table 14). Thrift institutions were the major losers ($2 billion) while households ($2.2 billion) and State and local governments ($0.9 billion) were the principal gainers of the massive agency purchases. On the basis of the simulation results, Hendershott estimated that the two lowest income quintiles (income groups) lost approximately $300 million, while the next two upper quintiles gained $300 million (see table 15). The highest quintile was estimated to lose about $50 million during the period. According to Hendershott, this occurs because low, lower-middle, and highest income groups all have the lowest mortgage debt relative to savings account holdings. The middle and upper-middle income households with relatively large mortgage debt are the gainers.[54]

TABLE 14.—ANNUAL NET INTEREST INCOME REDISTRIBUTION EFFECTS OF FSCA ACTIVITIES [1]

Gainers	Billions	Losers	Billions
Households	$2.2	Thrifts	$2.0
State and local governments	.9	Other finance	.7
Nonfinancial businesses	.1	Treasury	.5
FSCA's	.1	Commercial banks	.2
Rest of the world	.1		
Total	3.4	Total	3.4

[1] Reproduced from Hendershott, "A Flow of Funds Financial Model," 1977, p. 244.

TABLE 15.— GAINS OR LOSSES INDUCED BY THE INCREASE IN FSCA MORTGAGE HOLDINGS, BY INCOME QUINTILES [1]

[In billions of dollars]

	Income quintiles [2]				
Holders of					
Bank savings accounts	−0.15	−0.19	−0.16	−0.21	−0.66
Thrift savings accounts	−.16	−.18	−.22	−.33	−.92
Insurance and pension reserves	−.01	−.02	−.04	−.07	−.23
Primary securities	.05	.13	.11	.22	.80
Mortgage debt	.05	.14	.39	.61	1.09
Payers of—					
Federal taxes	−.02	−.06	−.09	−.12	−.32
State and local taxes	.04	.07	.10	.12	.19
Income shifts	−.20	−.11	.09	.22	−.05

[1] Reproduced from Hendershott, "A Flow of Funds Financial Model," 1977, p. 249.
[2] The approximate divisions between the income quintiles for 1975 are, in thousands of current dollars: 7.5, 12, 16.5 and 24.

In a separate estimate of the income redistributing effects of Federal credit activities, Hendershott and Villani (1977) concluded that activities of credit agencies during the 1968–70 and 1973–75 period resulted in a net loss to depositors of about $15 billion, including a $9 billion loss for thrift depositors and a $6 billion loss for commercial bank depositors. On the assumption that the lost depositor income went to mortgage suppliers through lower mortgage rates, Hendershott and Villani computed the net redistribution effects by income quintiles.

[54] Hendershott, op. cit., p. 250.

Looking at net gains and losses (i.e., deposit losses compared with mortgage gains for each quintile), they concluded that the net loss to the lowest income quintile was about $1 billion and that the net gain to the highest quintile was about $1 billion. The second lowest quintile lost another $540 million compared with a gain to the second highest quintile of $600 million.[55]

In a different study of the redistributional aspects of the mortgage insurance program, von Furstenberg found a powerful and progressive redistribution among income groups. He concluded that "the lower 50% of families account for almost 63% of expected defaults but certainly no more than 50% of total premium income . . ." [56]

FINANCING/REAL-ASSET MIX

Studies by Arcelus and Meltzer (1973) and Meltzer (1974) raise important doubts about the relationship of the financing mix to the allocation of economic resources. Meltzer (1974), for example, found considerable substitution in the form of borrowing, with no net increase in housing relative to total assests, between 1912 and 1970 (see table 16). The increased injection of mortgage credit, however, had the effect of altering the composition of household liabilities—raising the ratio of mortgage debt to total liabilities from 48 percent in 1912 to 61 percent in 1970. This combination of increased mortgage credit unmatched by an increased share of asset investment in housing led Meltzer to conclude that "mortgage loans finance acquisition of financial assets and real assets other than houses." [57] Thus, according to Meltzer, credit policy aimed at affecting the real asset mix through selective credit forms has been ineffective in housing over the long run.

TABLE 16.—HOUSING, MORTGAGES, AND LIABILITIES OF NONFARM HOUSEHOLDS

Year	Ratio of housing to total assets		Ratio of mortgage debt to housing		Ratio of mortgage debt to total liabilities
	(1)	(2)	(3)	(4)	(5)
1912	25.2		13.3		47.8
1922	24.8		12.5		46.0
1929	22.3	18.4	18.0	25.8	43.0
1933	25.0	20.0	18.8	28.7	49.7
1939	26.0	20.8	16.1	22.7	52.0
1950	27.5	23.9	17.3	20.9	60.9
1955	25.6	23.2	25.6	29.0	63.2
1958	24.9	22.6	29.1	29.0	65.9
1960	NA	NA	30.9	33.6	65.5
1970	NA	NA		37.5	61.0

Sources:
Meltzer, "Credit Availability and Economic Decisions: Some Evidence from the Mortgage and Housing Markets," Journal of Finance (June 1974), p. 765.
Col. 1: Goldsmith and Lipsy (1963), vol. I, table 65, p. 257.
Col. 2: Net housing stock from Survey of Current Business (1971), p. 25. Total assets as in col. 1.
Col. 3: Goldsmith and Lipsey (1963), vol. I, table 82, p. 292.
Col. 4: Total net housing from Survey of Current Business (1971). Mortgage debt from Goldsmith and Lipsey, vol. II, p. 340, lines 11 and 15, 1912–39; 1950–70 from Federal Reserve Flow-of-Funds Accounts, May 1971, p. 2.
Col. 5: Goldsmith and Lipsey, table 77, p. 383, 1960 and 1970, Flow-of-Funds.

Arcelus and Meltzer (1973) have proposed that to the extent credit is homogeneous, a loan "given for one purpose can be used for another, and there is no necessary expected relation between the composition

[55] Hendershott and Villani, op. cit., pp. 72–3.
[56] Von Furstenberg, "Risk Structures and the Distribution of Benefits within the FHA Home Mortgage Insurance Program," Journal of Money, Credit and Banking, August 1970, pp. 320–1.
[57] Meltzer, (1974), op. cit., pp. 764–5.

of credit and the composition of output." Attempts to facilitate investment in housing by changing the composition of credit to increase the volume of mortgages do not have the desired effect.[58]

Meltzer (1974) also addressed specifically the question of credit "availability" in the housing market and whether it had a separable dimension from its "cost." That is, whether it implied the existence of non-price rationing. In his study, Meltzer (1974) found that increasing the "availability" of mortgage credit affected the financial structure but not the real asset mix, and thus:

> . . . no evidence of any effect of mortgage policy or "availability" on the number of houses produced or purchased . . . Specifically, the effect on housing of financing the mortgage purchase (or sale) offsets the effect of the increased (or reduced) "availability" of credit in the form of mortgages.[59]

CONTRIBUTIONS TO FINANCIAL MARKET EFFICIENCY

The general development of Federal credit programs is believed to have improved the mobility and homogeneity of credit. Freedman, for example, has asserted that the development of national credit programs has helped organize national securities markets and reduced the regional and security-type yield differentials by increasing the consolidation of particular types of credit flows and providing secondary markets for the securities.

Again, the experience in housing has been demonstrative:

> Federal insurance of amortized mortgages initiated in the depths of the Great Depression has successfully broadened home ownership, improving housing standards and contributed to a healthy, competitive mortgage market. The flow of new savings into housing has also been facilitated by federal sponsorship of a central reservoir of credit for the savings and loan industry and by a government secondary market for the insured and guaranteed mortgages. Federal agencies have pioneered in broadening the flow of housing credit to various groups in special circumstances—including moderate-income families, the elderly, and those in farm and rural centers.[60]

PROGRAM CONFLICT

In a study of mortgage credit programs, Penner and Silber identified three types of programs: (1) wedge-type, in which an explicit subsidy is paid to the borrower or lender; (2) portfolio restriction, in which certain financial institutions are required to make certain types of investments—thus supplying more credit at lower yields than they might otherwise; and, (3) mortgage-characteristic; for example, guarantee programs. Wedge-type programs are most effective in credit markets exhibiting high degrees of substitutibility, although Penner and Silber note that this effectiveness must be qualified according to the source of program financing. Portfolio restriction programs are most adversely affected by substitutibility with other credit market instruments. The broadening of credit flows may also have a harmful effect on certain types of intermediaries, such as savings and loan associations, because of their unique asset/liability structures. Exposure of S&L's to volatile, efficient credit markets creates potential "feast or famine" profit swings, given the rigidity of earnings rates over time.

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[58] Arcelus and Meltzer, op. cit., p. 93.
[59] Meltzer, op. cit.
[60] Freedman, "Federal Credit Agencies . . ." p. 421.

Mortgage-characteristic programs have been used to standardize features of various mortgage securities, making them more investment worthy and thus homogeneous with other capital market securities. Silber later found, in a regression study of yield differentials, that agency securities were generally homogeneous with other capital market securities. These interrelationships among the three program types suggest to Penner and Silber that mortgage characteristic programs decrease the effectiveness of portfolio-restriction programs while increasing the effectiveness of wedge-type programs.[61]

VII. Final Observations

This discussion results in several important conclusions about Federal credit programs as well as some recommendations for public policy. First, despite the number of research and policy studies undertaken in this area, little can be said with any confidence about the effects of Federal credit activities. Although inference can be seriously misleading, the sheer size and rapid growth of credit activity demands that some analysis be attempted.

In general, credit programs have represented specialized, *ad hoc* responses to important public needs. Yet, unavoidably, these specialized programs have broad ramifications for other forms of public policy as well as the overall health of the economy. Collectively, credit programs have uneven impacts on all major economic variables. This suggests the need for a coherent credit policy that reflects not only the immediate objectives of particular programs, but also the relationships of program activities to overall economic conditions. This need for coordination is likely to increase not only because of the continued growth in total credit activity but also because of the potentially dominant role of sponsored credit activity over which Congress exercises the least direct control. At recent growth rates, this sponsored activity will represent two-thirds of all credit outstanding by fiscal year 1988.

Attempts to assess the effectiveness of programs by the amount of credit flowing through them are seriously misleading. One must also consider the effects on other lending institutions, other borrowers, real assets decisions, and price levels. Individually or collectively, these factors can completely undo the apparent effect.

One point is almost universally accepted. Credit programs have substantial short-run effects on credit flows. This fact creates both an opportunity and a problem for policymakers. A short-run stabilization effect would promote overall economic management objectives. Yet, the principal economic sector affected by credit activity is inherently countercyclical. Thus, credit programs in this area find themselves at odds with monetary policy, perhaps by design. In this case, the short-run impacts of credit programs have the result of shifting the stabilization burden to less-protected sectors.

There must be an effort in the selection of programs to disengage the financing mechanism from the perceived public purpose of the program. One way of assuring this result is to provide no comparative advantage among programs; that is, to avoid allowing some programs to seem costless by having them phrased as guarantee programs.

[61] Penner and Silber, "The Interaction Between Federal Credit Programs and the Impact on the Allocation of Credit," American Economic Review, December 1973, pp. 838–52.

If the financing of programs can be left to a second stage, or at least a separate part of the analysis, programs will compete more evenly.

A major problem remains in identifying and measuring the subsidy values of various forms of credit activity. These subsidies represent a potential for great waste. In addition, comparisons among alternative financing mechanisms on the basis of least cost will not be possible until some common framework for valuation is adopted. Although this valuation problem may appear to be a technical matter, it raises serious political problems in both implementing credit programs and interpreting their results.

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INFLATION AND THE FEDERAL INCOME TAX

By George F. Break*

CONTENTS

SUMMARY

As inflation has accelerated in recent years a complex and pervasive set of tax distortions has resulted from continued use of individual and corporation income taxes based on nominal money values. As a result, the neutrality of the Federal tax system has been severely impaired.

To understand the nature of these tax distortions it is necessary to distinguish between the two distinct ways in which Federal income taxes could be adjusted, or indexed, in order to neutralize the effects of inflation on taxpayers. Structural indexation, required because the taxes are progressive, would convert all money components of the rules by which tax liabilities are computed, such as personal exemptions, zero bracket amounts, and tax rate bracket limits, into constant-dollar amounts. This would be done by raising them each year by the rate of general price inflation in the most recent 12-month period for which processed data are available. Measurement indexation would shift the tax base from nominal money income to price-adjusted, or real, income. It must be admitted that neither of these methods is trouble free. In general, structural adjustments would be easy to make in practice but they are highly controversial in principle.

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Measurement adjustments, in contrast, are highly desirable in principle but costly and complex to put into practice.

To shift from money to real income as a base for taxation would mean making major changes in the distribution of taxable income among individuals and corporations. Whereas wage and salary income can be measured in straight money terms, with little or no distortion by the presence of inflation, neither property nor business income can. The nature of the required adjustments is a matter of some dispute. Mainly this is because there is no one concept of business income that is ideal for all purposes. To tax base designers, for example, all gains that can be measured objectively are equal. To shareholders or managers, however, the sustainability or liquidity of corporate gains is likely to be more important. Similar choices must be made among competing concepts of business real income. For tax purposes, it seems clear, one should choose a comprehensive, general purchasing power concept. Since all tax burdens are ultimately imposed on people, the best measure of their abilities to bear them is the increase in their command over goods and services during a given period of time. The measurement of taxable real income, in other words, should be based on a general price index that covers all consumption goods and services.

If such a general purchasing power concept of income were accepted as the proper tax base, business income would be converted from money to real terms by three main kinds of adjustemnt:

1. Inventories would be put on a constant-dollar FIFO basis under which beginning-of-the-period inventory values would be raised by the amount of general price inflation during the accounting period.

2. Original cost depreciation allowances would be converted to current-dollar terms by multiplying them by the ratio of the current-year general price index to its value in the year in which the assests were acquired.

3. Real capital gains and losses on business financial assets and liabilities would be included in taxable income on an accrual basis. On a bond worth $1,000 at the beginning and end of the year, for example, the adjustment for a 15 percent rate of inflation during the year would be a $150 real capital loss for the bondholder and an equal real capital gain for the debtor. When these purchasing power gains and losses on bond capital values are combined with nominal money interests receipts and expenses, the latter are converted into real terms.

Real gains and losses on business financial assets are sometimes omitted from proposals to adjust taxable business profits for inflation. They are, however, just as basic a part of the total conversion to a general purchasing power income concept as the other two adjustments. Since the inventory and depreciation adjustments make real income less than money income while the financial asset adjustment for net debtors, which most businesses are, has the reverse effect, real business profits may be either larger or smaller than nominal money profits. Variations in business capital structure and in asset composition necessarily make for large differentials among individual companies and between different industries in the size and direction of the gap between real and money income. Quantitative estimates of these differentials made by a number of experts are presented and discussed in the paper.

The tax burden distortions among different industries and individuals caused by failure to index the income tax base for inflation set in motion a pervasive set of intermediate economic effects. These include:

A shift of tax burdens from labor to capital income;

Highly variable increases in the before-tax real rates of return required to yield a given after-tax real rate of return;

An increase in the level and variability of market interest rates;

A shift of business capital structures away from equity, and toward debt financing; and

Important, but offsetting, effects on tax-created incentives for corporate mergers.

These intermediate effects, in turn, threaten to impose some very serious efficiency losses on the U.S. economy. The general nature of these effects is well known, but their quantitative dimensions are still highly uncertain. They include:

A reduction in the level of private saving and investment and hence in the Nation's rate of economic growth;

A diversion of resources from superior to inferior economic uses in response to the large tax burden differentials imposed on different sectors of the economy and on different industries;

A diversion of work effort from productive activities to the search for ways of minimizing the erratic and hard-to-predict effects of inflation on tax burdens; and

A discouragement of work effort undertaken in order to save for future consumption.

The potential effects on Federal tax policy are equally disturbing. Unless inflation abates significantly in the near future, continued use of an unindexed income tax base risks serious loss of public confidence in the equity of the income tax, and perhaps even in the government itself. Savers who are required to pay income taxes when they know that their real rates of return are negative are only one of the groups whose alienation from government may be intensified.

One obvious result would be heightened pressures for reductions in income tax rates. liberalization of the investment tax credit, greater acceleration of depreciation deductions, and expanded exclusion from the tax base of those kinds of income, such as capital gains and interest receipts, that are most subject to inflationary distortions. Such ad hoc adjustments are not likely to improve the overall equity and efficiency of the Federal income tax system, and if they were large enough they might well impair the ability of the Federal Government to finance its high-priority programs.

An alternative set of policy initiatives would seek to reduce the relative importance of the income tax in the Federal tax structure. In the absence of base indexation, inflation creates serious inequities and inefficiencies in the income tax that are absent from some of its major competitors. These more attractive sources of Federal revenue include a self-assessed personal consumption (or expenditure) tax, a value-added tax, or even the payroll tax for social security. Failure to index the income tax, in short, both strengthens the case for adopting a Federal value-added tax and weakens the case for financing some part of social security benefits from the general fund.

Indexation of the Federal individual income tax structure for inflation presents no serious administrative or compliance problems, but it does raise hard-to-answer questions about government performance in the modern world. Whether that performance would be better than it is now under an automatically operating, structurally indexed income-tax system is a closely debated question. Under such circumstances only experimentation can hope to resolve the conflicting arguments. The most relevant evidence in this case is provided by Canada's experience with structural indexation. Though only five years have passed since its enactment, the plan appears to be working well and not to have generated any of the ill effects that critics of structural indexation fear. If annual indexation of the Canadian type is not enacted, an alternative policy option that would serve many of the same goals would be a major reduction in the number of tax rate brackets used in the Federal individual income tax. The Treasury Department's 1977 "Blueprints for Basic Tax Reform," for example, included only three brackets in its model income and expenditure tax plans.

Tax base indexation is a policy option of considerable complexity. So also, however, is the alternative status quo option, and it does not have the solid theoretical foundation that supports tax base indexation. If a shift of options is to be made, it should be done sooner rather than later because persistent inflation tends to produce stronger and stronger pressures opposing the adoption of base indexation. Foreign experience illustrates the many difficulties created by delay and the complexities resulting from ad hoc adjustments to the inflationary distortions which plague a nominal money income tax. What has yet to be put to the test of experience is a systematic plan of tax base indexation. On its development and implementation may well depend the future of the income tax in this country.

Introduction

During any extended period of general price inflation income taxes based on nominal. rather than price-adjusted, money values create serious economic problems of two distinct kinds. One is that the measurement of different kinds of income is distorted to widely varying degrees over the period as a whole and also within particular subperiods. The burdens of an unadjusted income tax, therefore, will be distributed quite differently among households, businesses, and industries during and after a period of inflation than would have been the case under consistently stable price levels. These differential burdens raise some important questions about the equity and efficiency of the present Federal income tax system.

The second problem is created by the structure of all progressive income taxes. Even if the first problem is solved by measuring income properly during inflationary periods, people with constant real incomes over time will be subjected to higher and higher effective tax rates unless the structure of the tax is indexed for inflation by converting all of its nominal money components, such as personal exemptions, zero bracket amounts, and tax rate bracket limits, into constant-dollar amounts.

These two kinds of inflationary tax adjustment, mensural and structural, confront the policymaker with difficult choices of quite differing natures. The measurement adjustments are highly desirable in principle but costly to make in practice. The structural adjustments, in contrast, could be made relatively easily in practice, but their desirability in principle is highly controversial.

Income Measurement Under Inflation

Since the essence of income is gain (Simons 1938, p. 50), measuring its amount requires the subtraction of all costs and expenses from the gross receipts of sale of goods and services. Under stable price levels these two components of income measurement are in comparable units and can be subtracted without adjustment. Under inflationary conditions this is not the case. In principle, all dollar amounts to be used in the computation of income should be stated in the same units—i.e., in dollars of comparable general purchasing power. If this is not done the measured gain will be at least partly illusory because it results in no increase in the recipient's command over goods and services. An asset bought for 100 and sold for 250 at the end of a period during which prices doubled, for example, would yield the owner a real gain of 50 (measured in end-of-the-period dollars). In this case two-thirds of the nominal gain would be illusory. Any selling price below 200 would, of course, make all of the nominal gain illusory and in addition impose a net loss in purchasing power on the owner.

If personal income "connotes, broadly, the exercise of control over the use of society's scarce resources" (Simons, 1938, p. 49), then it must be measured in real terms. For some components of income the adjustments required to move from a nominal to a real measurement basis are of very minor significance. For others they are quite the opposite. This may be seen by looking at both the uses and the sources sides of a household's income accounts. Measured on the uses side, income is the sum of consumption and saving. Consumption, it is generally agreed, requires no special inflation adjustments because, by definition, it is measured in terms of the prices prevailing in the period in which the consumption occurred (Simons, 1938, p. 55). This feature of a retail sales, value-added, or self-assessed personal consumption tax is one of the major advantages of such levies, compared to a tax on personal income. The accumulation of wealth by saving, in contrast, will be badly mismeasured under inflationary conditions, as the example given above illustrates, unless suitable adjustments are made in the capital values from which the measure of net gain is derived.

By including saving in its base, the income tax sets itself on a collision course with inflation. If inflation is the one to give way, the income tax may emerge unscathed. If inflation persists with vigor, the income tax itself may be severely damaged.

Inflation adjustments also differ by type of income received on the sources side of household accounts.

Wages and Salaries

Wage and salary income does not, in general, require any measurement adjustments under inflationary conditions. Partly this is due to the fact that employee expenses of earning income are seldom of more

than minor significance, and when they are important, are usually incurred at the same price level as the wage receipts themselves. If human capital values were to be included in the income tax base, it is true, exactly the same inflationary adjustments would be needed for wage as for property income (Brinner, 1973, p. 573; 1976, pp. 125-26). There is, however, little or no interest in making such a change in the income tax base. As a result, the measurement of wage and salary income encounters no special problems because the general price level in the economy is changing.

Business Income

Changing prices do, however, greatly complicate the measurement of business income. Profit data are important to many different groups, and no one concept of business income can be expected to serve all users and all purposes equally well. To tax base designers, for example, all gains that can be measured objectively are equal. To corporate shareholders, in contrast, gains that can be sustained in future operations are more important than those that are unlikely to recur. The former point of view is reflected in the Haig-Simons, purchasing-power-accrual, concept of income; the latter in the standard accounting, or going concern, concept (Shoven and Bulow, 1975, pp. 561–65). The choice, in other words, is between a "general value" accounting measure that focuses on income recipients' abilities to buy goods and services in general and a "specific value" measure that concentrates on each firm's ability to replace the particular capital assets required for its future operations.

For tax purposes it is the general purchasing power concept of business income that is needed. Under it, three main kinds of inflation adjustments in current accounting practice are called for:

1. Eliminate inflationary inventory profits by converting all costs of goods sold to the same general price level as that applicable to sales receipts. Neither first-in, first-out (FIFO) nor last-in, last-out (LIFO) accounting is satisfactory for this purpose. FIFO does include gains from the holding of inventory in measured profits, as the Haig-Simons concept requires, but it does not distinguish between real gains that add to the owner's general purchasing power and inflationary gains that do not. LIFO does exclude inflationary gains on maintained inventories, but it also excludes all real gains as long as inventories are not reduced and then includes both real and nominal gains in income as inventories are liquidated. LIFO, in short, is more consistent with a "specific value," going-concern concept of income than with a general purchasing power measure (Shoven and Bulow, 1975, pp. 583–90). What is needed for the latter is adjusted, or constant-dollar, FIFO inventory accounting. For any firm using conventional FIFO procedures the adjustment would be a deduction from its nominal business income equal to the FIFO value of its beginning-of-the-period inventories multiplied by the change in the general price level during the period (Shoven and Bulow, 1975, p. 590). Adoption of constant-dollar FIFO inventory accounting for tax purposes would imply elimination of LIFO accounting as an optional way of computing taxable business income.

2. Convert depreciation deductions to a constant-dollar basis. The required adjustments would be directly comparable to those for inventories:

$$D'_n = D_n \frac{P_n}{P_o},$$

where

D'_n = adjusted depreciation measured in year n dollars,
D_n = unadjusted original cost depreciation,
P_n = value of general price index in the year n, and
P_o = value of general price index in year in which depreciable asset was purchased.

Original cost depreciation would simply be adjusted up or down in proportion to changes in the general price level.

3. Include in business income all real gains and losses on financial assets created by changes in the general price level. A one-year $1,000 bond with an interest rate of 12 percent, for example, would, under stable price levels, yield the bondholder an income of $120. If the inflation rate were 10 percent, however, the bondholder's real income, measured in end-of-the-year dollars, would be only $20. As in the previous two cases the inflation adustment would increase original costs by the rate of inflation prevailing up to the date of sale or termination of the contract:

$$\begin{aligned}\text{Real income} &= 1.12 \times \$1{,}000 - \$1{,}000 \times \frac{1.1}{1.0} \\ &= \$1{,}120 - \$1{,}100 \\ &= \$20.\end{aligned}$$

Conversely, the debtor's real interest costs would be $20 and not $120.

It is important to stress that these measurement adjustments are required regardless of whether the nominal interest rate adjusts upward in response to expected inflationary trends. If the interest rate under noninflationary conditions were 2 percent, the previous example indicates full upward adjustment for an anticipated inflation rate of 10 percent. Bondholders' real rates of return are then 2 percent in either case. If the noninflationary interest rate were 4 percent, bondholders would lose from inflation, as indicated by their price-level-adjusted rate of return of 2 percent. Conversely, if the noninflationary rate of return were only 1 percent, bondholders would enjoy, under the conditions assumed, a doubling of their real rate of return to 2 percent.

Personal Investment Income

All capital gains and losses realized by individual investors would be indexed for inflation by increasing original cost bases by the amount of the general price rise since the assets were purchased. That is:

$$G'_{on} = S_n - C_o \frac{P_n}{P_o},$$

where

G'_{on} = the real capital gain or loss realized on an asset purchased at time t_o and sold at t_n,

S_n=the sales value of the asset at t_n,
C_o=the cost of the asset at t_o,
P_n=value of the general price index at t_n, and
P_o=value of the general price index at t_o.

For all financial assets that are bought and sold or have fixed maturities, these inflation adjustments would not create any serious administrative or compliance problems (Brinner, 1976, pp. 127–32). An important policy issue would arise over the continuation of the present 60 percent exclusion of long-term capital gains from the Federal income tax base.

The problem would be to decide the extent to which the exclusion is intended to serve as a rough, second-best, inflation adjustment for capital assets. To that extent if should be eliminated with the adoption of inflation indexing for capital gains and losses. The exclusion, however, may also serve to keep at tolerable levels the investor lock-in effects that taxation on a realization basis creates. To that extent the exclusion should be kept until this need for it is eliminated by other structural changes in the income tax. Similar considerations apply to the role of the capital gains exclusion as a tax incentive for risk taking.

Another important policy choice would concern the treatment, under an indexed income tax, of demand and savings deposits. Two arguments can be made for excluding demand deposits from the indexing rules. One is that the imputed income now earned by depositors on checking accounts, mainly arising from the provision by banks of free check clearance and recording services, is not part of the present income tax base and hence does not qualify for any inflation adjustment. The other is that currency could not be indexed for administrative reasons and that demand deposits are so close a substitute for currency that they should be treated in the same way (Harberger, 1976, p. 148).

The last argument immediately raises questions about the substitutibility of passbook savings accounts for demand deposits. If the elasticity of such substitutions is high, indexing savings but not demand deposits would induce investor shifts between the two asset forms under inflationary conditions. On the other hand, even higher substitution elasticities probably exist between passbook savings accounts and the various kinds of fixed-term deposits offered by banks and other savings institutions. This is a strong argument for indexing passbook accounts so that inflation would not tend to drive them out of existence. Since passbook accounts have no fixed maturity, inflation adjustments for them would presumably be made on an accrual basis, with the relevant amounts being reported to depositors each year by the savings institutions.

Summary

Given that the essence of income is gain, maintenance of capital is a general requirement of all income calculations. Exactly how those maintenance deductions should be measured is the key issue in the present discussion. Under the ordinary kind of income tax capital, maintenance means keeping wealth intact in nominal money terms. Under the kind of inflation-adjusted (indexed) income tax discussed above, capital maintenance means keeping wealth intact in terms of its purchasing power over goods and services in general—that is, in real terms. This means, as Arthur Okun has noted, that using an unadjusted

income tax under inflationary conditions is equivalent to imposing a capital levy with a tax rate equal to the product of the inflation rate and each person's marginal income tax rate (Aaron, ed. 1976, p. 150). For an investor in the 60 percent marginal tax bracket, a 15 percent inflation rate, for example, would, without income tax indexing, imply a wealth tax rate of 9 percent. Since that is in addition to the income tax itself, the possibilities for wealth confiscation are apparent.

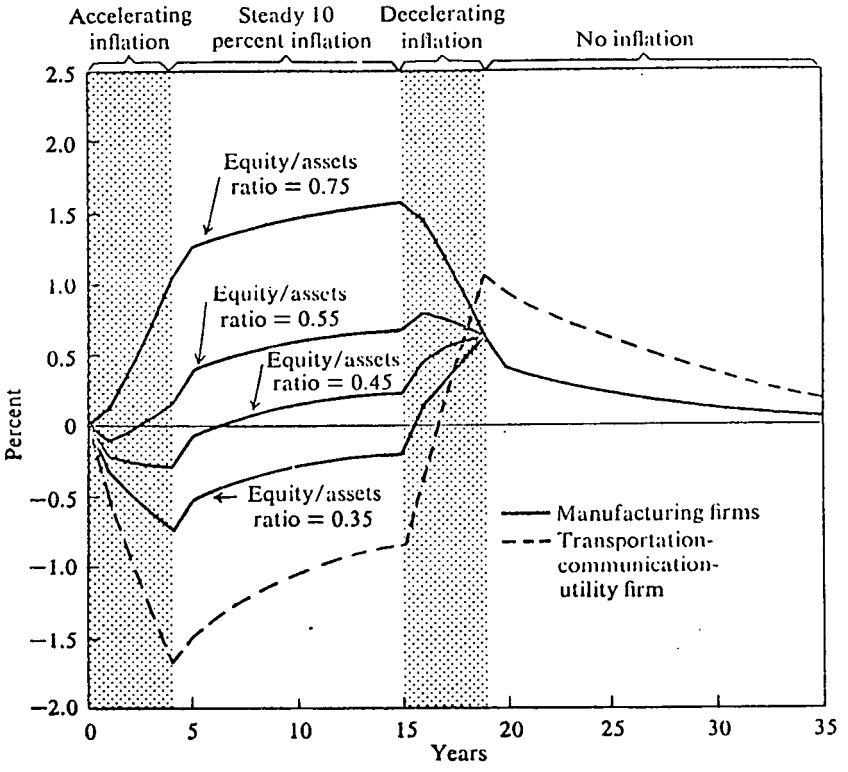
The wealth tax effects implicit in an unadjusted income tax readily explain the opposition to indexing of those who regard the present Federal tax system as insufficiently progressive in its vertical incidence. The equity of accomplishing by indirection what cannot be legislated directly is questionable, to say the least. Moreover, the economic effects of nominal income taxation, being unintended and unexamined, may well be broadly unacceptable to the great majority of the people. The complex nature of these impacts on the economy is just beginning to be revealed by researchers.

Tax Base Indexation: Impact Effects

An important, but not widely understood, determinant of the tax effects of inflation on different people and businesses is the time pattern that inflation happens to follow. This is clearly brought out in an analysis of business income by Tideman and Tucker (1976). Taking five hypothetical firms with different capital structures, they compute the tax over-and under-payments caused by different rates of inflation under an unadjusted income tax system. Their four representative manufacturing firms have equity-to-asset ratios ranging from a high 0.75, through the 1970 U.S. average of 0.55, to a low of 0.35. The fifth firm is a typical transportation-communications-utility enterprise with a high ratio of long-lived capital assets to inventory and a high debt-to-equity ratio. The inflation pattern assumed is one of accelerating price increase during the first 4 years—2.5, 5.0, 7.5, and 10 percent rates respectively—an 11-year period of steady 10 percent annual inflation, a 4-year decelerating period that exactly reverses the inflation pattern of the first period, and finally an extended period of no inflation.

Figure 1 shows the pattern of excess taxation under an unadjusted income tax for each of the five firms. Whereas the two high-equity manufacturing firms are overtaxed throughout the entire period, the two highly levered ones are first undertaxed and then overtaxed. The transportation-communications-utility firm enjoys unusually low burdens under an unadjusted tax until the middle of the decelerating inflationary period and excess burdens thereafter.

FIGURE 1.—Excess of actual taxes over taxes based on inflation-corrected income, as a percentage of assets, for four representative manufacturing firms and a representative transportation-communication-utility firm.



Source: Derived using the assumptions that follow. Initial values assumed for the manufacturing and transportation-communication-utility (TCU) firms, respectively, are total assets 100 and 210, monetary assets 25 and 17, short-term debt 20 and 30, annual equipment investment 3.27 and 10.90, annual structures investment 1.40 and 4.67, sales 100 and 100, cost of sales 70 and 55, and other costs 20 and 18. The long-term debt of the TCU firm is initially 85, while the long-term debts of the four different manufacturing firms are initially 5, 25, 35, and 45. All these magnitudes are assumed to grow at a constant 3 percent real rate. The tax accounting life of equipment is twelve years in manufacturing and twenty-five years in the TCU firm; all firms use a forty-year life for structures. Equipment and structures are depreciated by the 200 percent and the 150 percent declining balance methods, respectively. Inventories are turned over three times a year in manufacturing and six times a year in the TCU firm. The nominal interest rate on short-term debt adjusts completely to the current inflation rate within one year, while the average rate on outstanding long-term debt depends on an average of inflation rates over the past twenty years.

Source: T. Nicholaus Tideman and Donald P. Tucker, "The Tax Treatment of Business Profits Under Inflationary Conditions," in Henry J. Aaron ed. "Inflation and the Income Tax" (Brookings Institution, 1976), p. 46.

Clearly, the effects of inflation on a firm's tax liabilities cannot be determined by comparing its nominal and real profits in only one or two individual years. Mainly this is because the depreciation adjustment reflects both past and present inflation, builds up gradually under persistent inflation, and continues long after the inflation has stopped—in fact, until all assets on the books in the last year of price rise have been fully depreciated, sold, or scrapped. The adjustments to financial assets, in contrast, are present only when inflation is occurring and are a direct function of the current inflation rate.

A useful way of summarizing the impact of tax effects that differ from one year to the next is to compute the present value (at the after-tax real rate of return on corporate capital) of the entire sequence. Tideman and Tucker have done this for firms with assets of $1 million or more in the Treasury Department's 1972 corporate tax model file under two kinds of contrasting hypothetical inflation. Table 1 shows their estimated percentage tax under- and over-payments for nonfinancial firms in 20 different industry groups. The first two columns deal with the effects of a 10 percent inflation rate in one year only, followed by zero inflation rates thereafter. The differences shown between the first-year and the full-period effects are striking. The first column indicates first-year underpayments in all but one of the industries (finance, insurance, and real estate) ranging from 10 percent of unindexed tax liabilities in two groups to 374 percent in railroads and airlines. The long-run effects, shown in the second column, are quite different. For the all-nonfinancial-industry group the first-year underpayment of 37 percent of tax liabilities is sufficiently overbalanced by later tax overpayments to produce a total long-run excess tax burden of 18 percent. Degrees of total tax overburden vary widely in the other industries, from 1 percent in "other transport" to 134 percent in railroads. Services are the only group showing a long-run tax underpayment. Finally, the third column shows total steady-state annual tax overpayments if inflation persists indefinitely at 10 percent. The interindustry pattern is similar to that shown in the second column. though the amounts in each case are larger.

An important implication of the estimates shown in the first two columns of table 1 is that the present Federal corporation income tax is procyclical. When inflation accelerates, unindexed business tax burdens are typically less than those that would be imposed at that time by an inflation-adjusted corporate profits tax. Later, when inflation rates are falling and stimulus to aggregate private demand may be called for, unindexed tax system burdens exceed those under an indexed tax. Tideman and Tucker also conclude that "These results demonstrate that the surtax imposed by inflation is arbitrarily and inequitably distributed." (1976, p. 54).

TABLE 1.—AVERAGE TAX OVERPAYMENTS AS PERCENTAGE OF TAX LIABILITIES FOR FIRMS WITH ASSETS OF AT LEAST $1,000,000 IN 1972, ASSUMING 10-PERCENT INFLATION[1]

Industry	10-percent inflation in 1 yr		Steady-state overpayment, 10-percent inflation in every year
	1st-yr overpayment	Discounted total overpayment[2]	
Mining	−15	4	7
Contract construction	−35	14	18
Food and related products	−18	17	21
Petroleum refining	−23	31	39
Chemicals, rubber	−12	19	22
Other nondurables	−16	19	23
Primary metals	−78	23	36
Fabricated metals, nonelectrical machinery	−10	18	20
Electrical equipment	−24	5	8
Transportation equipment	−11	15	17
Other durables	−10	21	25
Railroads	−374	134	233
Airlines	−374	45	92
Other transport	−73	1	9
Communication	−111	29	48
Electric, gas utilities	−198	6	48
Trade	−21	26	29
Finance, insurance, real estate	46	64	68
Services	−94	−23	−13
All nonfinancial industries	−37	18	25

[1] Overpayment is the excess of tax liabilities based on conventional income over tax liabilities based on inflation-corrected income. An overpayment greater than 100 percent indicates that the industry earned an inflation-corrected loss although it earned a conventional profit.

[2] Future overpayments resulting from 1 yr's inflation were discounted at 5 percent in deriving the figures in this column.

Source: Tideman and Tucker, in Aaron ed. "Inflation and the Income Tax," p. 50. U.S. Department of the Treasury, 1972 corporate tax model file.

Hypothetical estimates of the kind just described are well suited to the identification of some of the main differences between indexed and unindexed income taxes. They cannot, of course, reveal the full complexity of effects that would be produced by a shift from the one kind of tax system to the other. A good example of the detailed estimates needed just to take a first step in the direction of reality is provided by the recent study of "Inflation and the Taxation of Capital Income in the Corporate Sector" by Feldstein and Summers (1979). In it they calculate that in 1977 inflation increased the total tax burden on nonfinancial corporate sector capital income by $32 billion. This excess inflation tax was 23 percent of estimated real income in the sector, and it made the total effective tax rate 66 percent in that year, rather than the 43 percent rate that would have been imposed by an indexed tax system.

Several aspects of the Feldstein-Summers estimates deserve comment. The first is that they are comprehensive measures of the tax burden on the total income generated by nonfinancial corporations for the benefit of their owners, both shareholders and bondholders. Table 2 shows the main components of the $32 billion excess inflation tax in 1977. The first three lines show the tax changes estimated to result from applying to corporate profits the three kinds of inflation

adjustment discussed above. Corporations lose from the use of original cost inventory and depreciation accounting but gain from the decline in the real value of their indebtedness as prices rise. The net effect of taxing nominal, rather than real, corporation income is estimated to be an excess tax of $11 billion in 1977. Shareholders are also subjected to countervailing influences. On the one hand, the excess corporation tax of $11 billion reduces dividends and capital gains and thereby lowers individual tax liabilities on corporate source income by $2 billion (line 4). Capital gains on corporate shares, on the other hand, are taxed on a nominal, rather than a constant-dollar, basis; and that is estimated to increase shareholder tax burdens by $5 billion (line 5). Corporate bondholders, finally, pay excess inflation-generated taxes of $18 billion (line 6). The total excess tax is thus $32 billion.

TABLE 2.—EXCESS INFLATION-CAUSED TAX BURDENS ON CORPORATE SOURCE INCOME, 1977

[In billions of dollars]

	Amount
A. Corporations	11
1. Inventories	7
2. Depreciable assets	19
3. Financial assets and liabilities	−15
B. Shareholders	3
4. Excess corporation taxes	−2
5. Capital gains and losses	5
C. Bondholders	18
6. Nonimal interest income	18
D. Total	32

Source: Feldstein and Summers (1979).

Looked at from the policy point of view, the Feldstein-Summers estimates are additive rather than adaptive. This is because they assume that the inflation adjustments discussed are simply added to the existing income tax law. It is, of course, highly unlikely that this would be done in practice. The existing tax structure would no doubt be adapted in various ways to the new addition, but it is not easy to say exactly how it should, or would, be changed. Two kinds of structural reforms could reasonably be said to be closely related to measurement indexation. The first would cover elimination of any tax features, such as accelerated depreciation, that were enacted in the past at least in part to compensate taxpayers for failure to adjust the income tax base for inflation. The second would include any changes needed to offset whatever undesirable equity and efficiency effects measurement indexation might be expected to have. Since none of these adaptations can be specified with confidence, there is much to be said for concentrating solely on the effects of measurement indexation by itself, as Feldstein and Summers do.

Finally, looked at from an economic point of view, the Feldstein-Summers estimates are impact measures only. That is, they show the effects of tax base indexation on different groups on the assumption that no one alters behavior in response to the identified changes in tax burdens. Impact measures are obviously not the final answer, but they are a necessary first step in the derivation of that answer. Interpreted

in that light, they can be a very useful input into Federal tax policymaking.

The detailed analysis of 1977 data is extended by Feldstein and Summers in two important ways. One is the estimation of annual inflation tax burdens on the nonfinancial corporate sector for the 1954–77 period. In brief, these measures indicate an excess tax of less than $5 billion a year until the mid-1960's, a doubling of that burden by 1970, and another doubling by 1973 (Feldstein and Summers 1979, pp. 28–30). For the past 10 years, then, a tax system designed for a noninflationary economy has been imposing on corporate source income extra tax burdens of very substantial size.

Severe distortions have also been created within the corporate sector itself. Using data first made available in 1976 by individual companies on their 10–K reports filed with the SEC concerning inflationary inventory profits and the excess of replacement cost over original cost depreciation, Feldstein and Summers analyzed a sample of 327 firms classified into the 20 two-digit manufacturing industries. Table 3 shows their estimates of the extra inflation tax paid by each industry in 1976 as a percentage of both actual taxes paid in that year (column 5) and the replacement value of their capital (column 6). The interindustry differentials are very large. The efficiency losses created by such tax distortions may well be one of the most serious effects of inflation on the present Federal tax system.

TABLE 3—INFLATION, DEPRECIATION, AND CORPORATE TAX LIABILITIES IN MANUFACTURING INDUSTRIES

[Dollar amounts in millions]

S.I.C. Code—Industry	Sample firms				Additional taxes as percent of		Estimated industry totals	
	N (1)	Sales coverage (percent) (2)	Overstatement of profits (3)	Additional taxes (4)	Actual taxes paid (5)	Replacement value of capital (6)	Overstatement of profits (7)	Additional taxes (8)
20—Food and kindred products	28	45	$1,339	$642.0	57.0	3.0	$2,989	$1,435
21—Cigars and cigarettes	6	70	378	181.0	33.0	1.8	535	257
22—Textile mill products	6	25	153	73.0	78.7	2.9	623	299
23—Apparel and other finished products	6	22	46	22.0	40.6	2.0	211	102
24—Lumber and products	6	83	678	252.0	100.0	2.5	820	304
25—Furniture and fixtures	4	69	35	17.0	65.1	2.0	52	25
26—Paper and products	20	70	858	371.0	100.0	2.3	1,230	532
27—Publications and printing	12	50	153	74.0	28.2	2.6	308	148
28—Chemicals and products	43	62	1,796	862.0	48.9	1.8	2,892	1,388
29—Petroleum products	22	49	2,970	1,426.0	70.3	1.8	6,025	2,892
30—Rubber and miscellaneous plastics	5	48	694	9.3	100.0	1.1	1,448	194
31—Leather and products	3	58	59	28.0	22.7	2.6	101	48
32—Glass, clay, and stone products	23	81	593	284.0	73.7	2.0	725	348
33—Primary metals	20	64	1,828	180.0	100.0	.4	2,852	280
34—Fabricated metal products	12	46	186	89.0	49.5	2.6	401	193
35—Nonelectrical machinery	45	64	707	339.0	17.8	.9	1,103	529
36—Electrical machinery	26	60	949	455.0	46.6	2.1	1,571	754
37—Transportation equipment	24	62	1,644	789.0	29.4	1.8	2,639	1,267
38—Instruments	12	49	221	106.0	30.1	1.5	456	219
39—Miscellaneous manufactures	4	41	51	24.0	33.1	1.7	124	60

Note: All figures refer to 1976. Overstatement of profits includes the effects of both historic cost depreciation and artificial inventory profits. The number of firms in the sample for each industry is shown in col. 1; these firms account for the percentage of industry sales in col. 2.

The final step in any study of the impact of tax base indexation on the distribution of corporation tax burdens is to compare the effects on individual companies. This has been done by Davidson and Weil (1976) for the 30 Dow Jones Industrial companies in 1974. Their results, computed both before and after the inclusion of real gains and losses on financial assets (called monetary items in the table), are shown in table 4. For the 30 companies as a group, price-adjusted income was less than conventionally reported income in 1974, but the individual variations around the average were huge. Whereas Texaco and Proctor & Gamble had fully adjusted income very close to their conventionally reported profits, as indicated by their respective percentages of 106 and 98 shown in the last column of the table, two companies (Sears Roebuck and Westinghouse Electric) had conventional profits converted into adjusted-basis losses, Chrysler had its reported losses nearly tripled, and American Telephone & Telegraph had its reported profits nearly doubled.

Another important kind of income now measured for taxpayers in quite misleading ways consists of capital gains and losses realized by business and individual portfolio investors. A detailed study of the effects of inflation adjustments in this area has been made by Feldstein and Slemrod (1978). Using data from a subsample of over 30,000 individuals who sold corporate stock in 1973, selected from the IRS–TD special sample study of capital asset transactions in that year, Feldstein and Slemrod computed their price-adjusted realized gains and losses. Specifically,

$$G' = S_{73} - C\,\frac{CPI_{73}}{{}_{i}CPI},$$

where

G' = price-adjusted capital gain or loss,
S_{73} = sales price of capital asset in 1973,
C_i = cost of capital asset acquired in year i,
CPI_{73} = value of the Consumer Price Index in 1973, and
CPI_i = value of the Consumer Price Index in year i.

TABLE 4.—INCOME AS CONVENTIONALLY REPORTED AND AS ESTIMATED AFTER GENERAL PRICE LEVEL ADJUSTMENT, 30 DOW JONES INDUSTRIALS, 1974

[Dollar amounts in millions]

Company	Income as conventionally reported (historical dollars)	Income after price level adjustment (end-of-1974 dollars)		Income after price level adjustment as a percentage of conventionally reported income	
		Before gain on monetary items	Including gain on monetary items	Before gain on monetary items	Including gain on monetary items
	(1)	(2)	(3)	(4)	(5)
Allied Chemical	$150.8	$89.7	$136.1	$60.0	$90.0
Aluminum Co. of America	173.1	118.7	219.4	69.0	127.0
American Brands	136.6	76.0	150.2	56.0	110.0
American Can	95.1	59.6	99.7	63.0	105.0
American Telephone & Telegraph	3,169.9	2,397.5	5,997.0	76.0	189.0
Anaconda	247.1	231.6	270.6	94.0	110.0
Bethlehem Steel	342.1	220.2	283.0	64.0	83.0
Chrysler	−52.1	−300.6	−144.0	[1] 577.0	[1] 276.0
Du Pont	403.5	175.1	185.2	43.0	46.0
Eastman Kodak	629.5	536.2	467.2	85.0	74.0
Esmark	68.1	4.8	41.1	7.0	60.0
Exxon	3,142.2	2,678.0	2,752.6	85.0	88.0
General Electric	608.1	391.4	568.7	64.0	94.0
General Foods	99.4	20.2	66.7	20.0	67.0
General Motors	950.0	−185.3	1.0	[2] −20.0	([3])
Goodyear	157.4	1.2	147.7	1.0	94.0
International Harvester	124.1	−55.9	53.4	[2] −45.0	43.0
International Nickel	306.0	254.2	291.9	83.0	95.0
International Paper	262.6	168.1	212.7	64.0	81.0
Johns-Manville	72.0	60.3	75.8	84.0	105.0
Owens-Illinois	83.5	56.5	117.5	68.0	141.0
Procter & Gamble	316.7	262.8	310.6	83.0	98.0
Sears Roebuck	511.4	14.0	−16.7	3.0	[2] −3.0
Standard Oil of California	970.0	631.0	846.2	65.0	87.0
Texaco	1,586.5	1,527.2	1,673.9	96.0	106.0
Union Carbide	530.1	454.5	490.9	86.0	93.0
United States Steel	634.9	401.6	501.6	63.0	79.0
United Technologies (United Aircraft)	104.7	−4.4	26.5	[2] −4.0	25.0
Westinghouse Electric	28.1	−93.8	−46.8	[2] −334.0	[2] −167.0
Woolworth	64.8	−44.3	42.7	[2] −63.0	66.0
All companies	15,916.2	10,146.1	15,822.4	63.7	99.4
Median (percent)				64.0	89.0

[1] Estimated loss as a percentage of reported loss.
[2] Loss equal to indicated percentage of positive net income.
[3] Less than 0.5.

Note: Col. 1 was derived from published income statments of the various companies and 10-K reports submitted by the companies to the U.S. Securities and Exchange Commission. Co. 2 and 3 were derived as were comparable items in table 3–1. Col. 4 equals col. 2 divided by col. 1. Col. 5 equals col. 3 divided by col. 1. Figures are rounded.

Source: Davidson and Weil (1976), pp. 90–91.

The results, given in table 5, are striking. All taxpayers are estimated to have realized net nominal capital gains on corporate stock of $4.6 billion in 1973, distributed among eight adjusted gross income (AGI) classes as shown in the first line of the table. The estimated tax liability on these realized gains was $1.1 billion (line 3). If, however, the same realized gains and losses had been measured on a price-adjusted or real basis, the net taxable amounts in each AGI class would have been those shown in the second line of the table. It is especially notable that net real losses would have been realized in each of the five AGI classes below $100,000 and by all corporate shareholders as a group. In the aggregate, in other words, a net real capital loss of $0.9 billion (line 2) was mismeasured in 1973 as a net nominal capital gain of $4.6 billion. The fourth line of the table shows the tax liabilities of each AGI class under a price-adjusted capital gains tax using the same rates and loss offset limitations that prevailed in 1973. Though shareholders in the bottom four AGI classes would have had negative tax liabilities of $0.1 billion, those in the other classes would have owed $0.8 billion, and a net capital gains tax revenue of $0.7 billion would have been generated.

TABLE 5.—CAPITAL GAINS AND ASSOCIATED TAX LIABILITIES

[Dollar amounts in millions of dollars]

	Adjusted gross income class								
	Less than zero	Zero to $10,000	$10,000 to $20,000	$20,000 to $50,000	$50,000 to $100,000	$100,000 to $200,000	$200,000 to $500,000	More than $500,000	All
1. Nominal capital gains	$86	$77	$21	$369	$719	$942	$1,135	$1,280	$4,629
2. Real capital gains	−15	−726	−895	−1,420	−255	437	839	1,125	−910
3. Tax on nominal capital gains	1	−5	23	80	159	215	291	374	1,138
4. Tax on real capital gains	0	−25	−34	−52	58	141	235	337	661

Note: All figures relate to capital gains on corporate stock sold in 1973

Source: Martin Feldstein and Joel Slemrod, "Inflation and the Excess Taxation of Capital Gains on Corporate Stock," National Tax Journal, vol 31 (June 1978), p. 109.

The interpersonal inequities created by the taxation of nominal capital gains and losses under inflationary conditions are all too obvious. Moreover, since the excess inflation-created tax liabilities can be avoided by postponing realization of taxable gains, the net effect is likely to be a significant increase in investor lock-in effects. That shareholders are very sensitive to tax considerations, particularly in decisions to switch from one investment asset to another, is the message of two recent empirical studies that will be discussed later (Feldstein and Yitzhaki, 1978; Feldstein, Slemrod, and Yitzhaki, 1978).

Tax Base Indexation: Intermediate Effects

The impact effects of tax base indexation just discussed are only the beginning of the story. Their function is to indicate whether the story is worth pursuing. In this case it clearly is. As long as inflation rates equal, or exceed, those prevailing in the mid-1970's, failure to index the Federal income tax base will generate large and highly variable tax burden distortions among different businesses and individuals. The fiscal and economic effects set in motion by these distortions are

likely to be of major proportions. Some of these effects will occur relatively quickly and will thereby set the stage for the development of still more important changes in the performance of the U.S. economy. The general nature of the most important of these intermediate effects is well established in the literature. They include:

A shift of tax burdens from labor to capital income;

Highly variable increases in the before-tax real rates of return required to yield a given after-tax real rate of return;

An increase in the level and variability of market interest rates;

A shift of business capital structures away from equity, and toward debt, financing; and

Important, but offsetting, effects on tax-created incentives for corporate mergers.

Shift of Tax Burdens From Labor to Capital Income

In general, as the preceding discussion showed, inflation adjustments would reduce the amount of business and property income subject to taxation but would not affect wage and salary income in any major way. Failure to index the Federal income tax base for inflation, therefore, tends to shift its burdens from labor to capital income. This shifting is inevitable if Congress reacts to inflation by allowing real tax burdens and revenues to rise. Even if real burdens were to be held approximately constant by an across-the-board reduction of tax rates, applying more or less proportionately to all kinds of income in the aggregate, there would be a shift of income tax burdens from labor to capital income.

Increase in Required Before-Tax Rates of Return on Business Investment

A neutral tax system is one that requires the same real before-tax rate of return on all investments in order to yield the owner a given net-of-tax return. The first column of table 6 illustrates the nature of some of the nonneutralities that would be present under the current tax structure in the absence of inflation. Owners of inventories need a gross rate of return of 11½ percent to yield a net-of-tax rate of 6 percent, owners of structures need 10 percent, and owners of equipment require different rates, depending on its length of life, depreciation pattern, and the size of any investment tax credit allowed. The table also shows the effects of inflation on these required rates of return. If the tax base is not indexed, the rates are uniformly raised, but by different amounts (columns 2 and 3). With a 10 percent investment tax credit, which itself favors short-lived equipment (column 1), a 7 percent inflation rate, for example, would raise required rates of return more on short-lived than on long-lived equipment (column 3). Short holding period (i.e., FIFO) inventories would become unattractive relative to long holding period (i.e., LIFO) inventories. In general, the magnitudes of the required before-tax rate differentials among different kinds of assets would increase.

If the tax base were fully indexed, in contrast, none of these inflation-created changes in required rates of return would occur. The first column of table 6 shows the set of before-tax rates of return required to yield 6 percent net of taxes both in a noninflationary world and in an inflationary one with a fully indexed business income tax base.

Table 6 highlights two important features of the present Federal income tax system. One is that even moderate rates of inflation of 7 percent have significant effects on required rates of return on business assets. The second is that Federal income taxes would not be neutral even in the absence of inflation. Consideration of tax-base indexation therefore raises difficult policy questions as to which of the existing tax nonneutralities should be changed and to what extent. Finally, it should be stressed that the table does not show the changes in required before-tax rates of return that would necessarily accompany any shift to a price-adjusted income tax base. The calculations shown assume a given required net-of-tax real rate of return (6 percent), and required net rates may well vary in response to varying rates of price inflation. Tideman and Tucker in fact suggest that the real cost of capital may be lower when inflation is higher (1976, p. 41), but that is a complicated question to which there are as yet no clear-cut answers.

TABLE 6.—REAL BEFORE-TAX RATES OF RETURN REQUIRED TO YIELD A 6-PERCENT REAL RETURN AFTER BUSINESS TAXES, BY TYPE OF ASSET

[In percent]

Asset, investment tax credit, and life or holding period	No inflation or full correction	2-percent inflation	7-percent inflation
Equipment:[1]			
Investment tax credit equals 0:			
Life:			
5 yr	9.4	10.4	12.7
12 yr	9.6	10.5	12.4
20 yr	9.9	10.7	12.4
Investment tax credit equals 7 percent:			
Life:			
5 yr	6.1	7.2	9.5
12 yr	7.1	8.0	10.0
20 yr	8.0	8.9	10.6
Investment tax credit equals 10 percent:			
Life:			
5 yr	4.8	5.8	8.1
12 yr	6.0	7.0	8.9
20 yr	7.3	8.1	9.8
Structures:			
Life:			
25 yr	10.0	10.7	11.8
50 yr	10.0	10.4	11.0
Inventory:			
Holding period:			
1 yr	11.5	13.3	17.6
30 yr	11.5	12.0	12.5
100 yr	11.5	11.6	11.6

[1] Assumed to depreciate at 1½ times the straight-line depreciation rate.

Source: Tideman and Tucker (1976), p. 39.

Increases in the Level and Variability of Market Interest Rates

The effects of inflation on interest rates are exceedingly complex. Difficult distinctions must be made between anticipated and unanticipated changes in the price level, and attention must focus not only on the debt instruments themselves but also on the assets or liabilities that are directly related to them.

It is well established that, in general, borrowers enjoy windfall gains when prices rise unexpectedly and that lenders suffer windfall losses. As John Bossons has stressed (1974, p. 110), however, these redistributive transfers occur only among debtors and creditors with

unhedged wealth positions. Either party may hedge by combining assets and liabilities subject to similar inflation risks. Businesses, for example, may protect themselves against risks of rising replacement costs for their long-lived assets (because of generally rising price levels) by financing those assets by long-term debt. In that way they could balance the losses created by the use of original cost depreciation for tax purposes against the untaxed gains on their monetary liabilities. Debt-financed business assets need not in principle be indexed for inflation since the income reductions on asset account would be exactly balanced by the income increases on liability account (Fellner, Clarkson, and Moore 1975, pp. 5–8).

Whatever the opportunities for such hedging may be, it is clear that an unindexed income tax base will accentuate whatever windfall gains and losses unanticipated inflation generates. Such a tax system acts to magnify the economic inequities and distortions created by inflation.

Anticipated inflation, however, is another matter. While it is generally agreed that money interest rates will adjust upwards in response to expected inflation, it is not clear how large that adjustment will be. Tax considerations aside, the basic relation here is:

$$r = r' + ag,$$

where

r = the market, or nominal, rate of interest,
r' = the real rate of interest,
g = the anticipated rate of inflation, and
a = behavioral parameter indicating the relation between market and real rates of interest when inflation is anticipated.

If the parameter a were equal to one, as Irving Fisher (1930) argued it would be under ideal conditions, real interest rates would be invariant to different rates of anticipated inflation. Fisher, however, was dealing with a hypothetical world and moreover one in which no income tax existed. Though the question is far from settled, recent empirical studies tend to support the conclusion that a is unity or less (Tanzi 1977, p. 501). Benjamin Friedman (1978), for example, found its value to be 0.64 for this country, and Feldstein and Summers (1978) obtained estimates close to unity.

For present purposes the important money interest rate is not the actual one prevailing in the market, but rather the rate required to keep net-of-tax real rates constant. This is:

$$r^* = r' + g/(1-t),$$

where t = the marginal income tax rate of the investor or borrower in question.

It should be stressed that r^* is the required rate if the income tax base is not indexed for inflation. Since indexing would not tax inflation premiums as income to lenders, nor allow them as cost deductions to borrowers, the required inflation-compensating money interest rate under an indexed tax system would simply be:

$$r^{**} = r' + g.$$

It is instructive to compare these two required rates of return under different rates of anticipated inflation and for investors with different marginal tax rates. For example, if the real rate, r', is 3 percent:

INFLATION-INVARIANT RATES OF RETURN

	Tax base indexed system (r^{**})	Unindexed income tax system (r^{*})	
		t equals 0.25	t equals 0.50
Anticipated rates of inflation (g):			
0	0.03	.03	.03
.05	.08	.10	.13
.10	.13	.16	.23
.15	.18	.23	.33
.20	.23	.30	.43

Note: The required market rate is both higher and more volatile under an unindexed tax system.

The vertical distributional effects of an unindexed income tax may be derived from these basic propositions. Vito Tanzi (1977), for example, has computed the market interest rates required in 1972, 1973, and 1974 to provide lenders at different AGI levels with a zero real rate of return. His estimates are shown in table 7. If these required rates are compared with the market rates actually prevailing in those years, shown in table 8, it is clear that most lenders could have realized positive real after-tax rates of return in 1972, but that few could have done so in 1974. Tanzi estimates that the tax treatment of interest income and expense in these years redistributed income from the lowest and highest income groups (those with adjusted gross incomes below $10,000 and above $50,000) to the middle income groups and the Federal Government (1977, p. 511).

TABLE 7.—INTEREST RATES REQUIRED TO PROVIDE LENDERS WITH ZERO REAL INTEREST INCOMES, 1972–74

[In percent]

Adjusted gross income (thousand U.S. dollars)	1972	1973	1974
Under 1	3.36	6.31	11.52
1 to 2	4.42	6.47	11.38
2 to 3	3.39	6.37	11.28
3 to 4	3.47	6.53	11.59
4 to 5	3.53	6.64	11.79
5 to 6	3.57	6.70	11.93
6 to 7	3.60	6.77	12.04
7 to 8	3.62	6.83	12.13
8 to 9	3.64	6.83	12.22
9 to 10	3.65	6.89	12.26
10 to 11	3.67	6.92	12.30
11 to 12	3.68	6.93	12.32
12 to 13	3.69	6.96	12.37
13 to 14	3.71	6.98	12.42
14 to 15	3.73	7.01	12.46
15 to 20	3.77	7.09	12.60
20 to 25	3.86	7.23	12.87
25 to 30	3.93	7.38	13.08
30 to 50	4.08	7.65	13.56
50 to 100	4.51	8.42	14.97
100 to 200	5.05	9.45	16.90
200 to 500	5.57	10.44	18.80
500 to 1,000	6.04	11.61	20.22
Above 1,000	6.08	11.65	21.65

TABLE 8.—INTEREST RATES AND BOND YIELDS, 1972–74

[In percent per annum]

	U.S. Government securities			Corporate bonds (Moody's Aaa)	High-grade municipal bonds [3] (Standard & Poor's)	Prime commercial paper, 4 to 6 mo maturity	U.S. Federal Housing Administration new home mortgage yields
	3-mo treasury bills [1]	3-yr to 5-yr issues [2]	Longer-term bonds				
1972	4.071	5.85	5.63	7.21	5.27	4.69	7.53
1973	7.041	6.92	6.30	7.44	5.18	8.15	8.08
1974	7.886	7.81	6.99	8.57	6.09	9.87	9.47

[1] Rate on new issues within period.
[2] Selected note and bond issues.
[3] These are tax exempt.

Source: Vito Tanzi (1977), pp. 505–506. U.S. Council of Economic Advisers, "Economic Report of the President" (Washington, 1976), p. 239.

Corporate Shifts From Equity to Debt Financing

The full deductibility of nominal interest expenses under an unindexed income tax reduces the cost of debt capital relative to equity and thereby encourages corporations to shift their capital structures accordingly. Looked at in another way, debt financing permits businesses to offset the excess taxable profits created by original cost depreciation and FIFO inventory accounting with excess cost deductions for interest cost. More highly levered business enterprises, of course, face higher risks of liquidity squeezes and of eventual bankruptcy in a world of fluctuating inflation and unemployment rates.

Tax Incentives for Mergers

Since tax base indexing would increase the occurrence of business loss carryovers, it would strengthen this important financial incentive for mergers. On the other hand, indexing would eliminate the incentives that firms now have to merge in order to avoid the tax consequences of liquidating LIFO inventories (Tideman and Tucker 1976, p. 42).

Tax Base Indexation: Final Efficiency Effects

When one comes down to the bottom line, which deals with effects on the performance of the U.S. economy, one encounters all of the familiar problems of measuring the value of gains and losses in national output and, particularly, of separating those caused by specific tax distortions from the others. Empirical work on these questions has been greatly stimulated by the recent development of the comprehensive microdata sets required for either comparative static or dynamic analyses of tax policy changes. This research, much of it supported by the Treasury Department's Office of Tax Analysis, is still in its early stages, and only a small portion of it has been published (Shoven, 1976; Fullerton, Shoven, and Whalley, 1978a and 1978b; Fullerton, King, Shoven, and Whalley, 1978). Tax policy choices must therefore be made under conditions of considerable uncertainty concerning the economic efficiency effects likely to result therefrom.

Nevertheless, the known effects of taxing nominal money incomes in an inflationary world, discussed above, clearly establish a strong presumption that the efficiency looses thereby imposed on the economy will be large. In the main, these losses are likely to result from four kinds of basic tax distortion:

(1) A reduction in the level of private saving and investment and hence in the Nation's rate of economic growth.

(2) A diversion of resources from high-taxed sectors and industries into less productive, lower-taxed areas.

(3) A diversion of work effort from productive activities to the search for ways of minimizing the erratic and hard-to-predict effects of inflation on tax burdens.

(4) A discouragement of work effort undertaken to save for future consumption.

That continued use of an unindexed income-tax base risks serious impairment of private sector incentives to save and invest is implied by an impressive number of the effects previously discussed. They include:

The shift of tax burdens from labor to capital income;

The increase in the gross rates of return required to yield a given net-of-tax real rate of return;

The increase in lock-in effects for portfolio investors with large accrued nominal capital gains; and

The increased investor uncertainty resulting from more volatile market interest rates, from tax burdens that depend on future rates of inflation, and from the increased risks of liquidity squeezes (or even bankruptcy, related by tax incentives for debt, rather than equity, financing).

This is an impressive array of factors helping to create investment and saving disincentives. Though their quantitative impact cannot now be estimated precisely, their absence under a base-indexed income tax system offers considerable promise of improved economic performance as a result of a shift to such a fiscal regime.

Even if base indexing provided no substantial stimulus to total saving and investment, its adoption would clearly have significant effects on the allocation of resources to higher or lower rate-of-return uses in the economy. Some of these tax-induced distortions might indeed offset previously established distortions and thereby produce a net improvement in economic efficiency. Few such cases have been documented so far, however, and until they are, the presumption must be that the resource reallocations created by failure to index the Federal income tax base do reduce economic efficiency. As Richard A. Musgrave puts it, "The chance that the distortions caused by inflation will just happen to offset other distortions found in the tax structure is very small. The income tax should relate to real income" (Aaron, ed. 1976, p. 324).

The allocation effects of an unindexed income tax base are pervasive and complex. They include:

A redirection of investment away from business plant and equipment toward residential real estate and consumer durables;

A reallocation of resources among different industries, some of the specific dimensions of which are shown clearly in table 3 above; and

A diversion of business investment choices away from assets with relatively high required before-tax rates of return to those with lower rates.

All of these effects interact with others produced by long-established features of the tax system—accelerated depreciation, the asset depreciation range, and the investment tax credit. One clear result of this situation is great uncertainty about what the effects of the Federal income tax system on business investment really are. There may in fact be much ado about nothing, with some incentive features of the present law more or less offsetting the disincentive features of the same law. Persistent inflation increases the probabilities of such a standoff and makes more urgent an early, comprehensive reexamination of all investment tax incentives and disincentives.

The diversion of work effort into unproductive activities or leisure also threatens future performance levels of the economy. Wastage of workers' time and energy might not be so troublesome if the U.S. economy were growing at its historical pre-inflation rates. As a contributor to current slow rates of labor productivity growth, however, it must be taken very seriously indeed. Future growth rates will also be reduced if negative, or uncertain, real net-of-tax rates of return on personal saving induce a significant substitution of leisure for work. Recent research by Boskin and Lau suggests that this may well be the case. As they put it: "Our estimates suggest that the consumption saving choice is strongly influenced by relative prices, including the forward price of future consumption. Our estimates, which appear to be measured quite precisely, suggest that leisure and future consumption are much stronger substitutes than leisure and current consumption" (1978, p. 5).

These, then, are the many distortions, inequities, and economic inefficiencies created by the failure to measure taxable incomes correctly under inflationary conditions. Enactment of measurement indexation would eliminate them, but it would not completely neutralize the effects of inflation on Federal taxpayers. Because the Federal income tax system is progressive and even with measurement indexation in operation would be based on current dollar values that keep rising in line with the general price level, inflation steadily increases the effective tax rate applicable to incomes that are constant in real terms over time. These inflationary tax burden effects can, however, be dealt with by structural indexation.

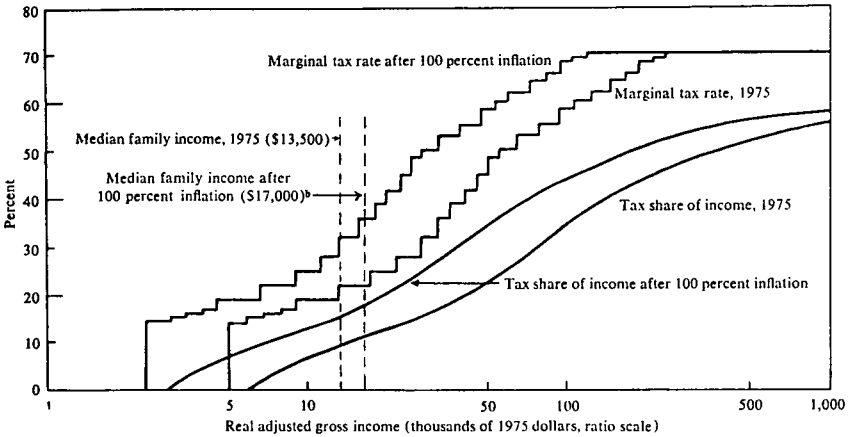
Structural Indexation

If the Federal individual income tax were levied at a single rate on each person's total income, there would be no need for any structural adjustments in it in response to inflation. If the single tax rate were applied to income above some basic exemption level for each size of family, and if that exemption level were stated in nominal money terms, inflation would raise average tax burdens, particularly for those with incomes just above the exemption levels. Structural indexation in this case would involve a simple upward adjustment each year of exemption amounts by the general rate of inflation.

Though existing income taxes are a good deal more complicated than the simple designs just discussed, structural indexation for them would follow exactly the same basic principles. All structural components stated in nominal money values would be converted to constant-dollar (or real) terms by increasing them each year by the average amount of inflation. With personal exemptions and zero bracket amounts indexed in this way, families with low incomes would not be pushed by inflation into taxable status, nor would those just above exemption levels experience rapidly rising average tax rates even though their money incomes were only keeping up with rising price levels. With all tax-rate brackets indexed in a similar manner, higher income families with stable real incomes would remain in the same marginal tax bracket rather than being steadily pushed, as they are now in the absence of discretionary tax reductions, into higher and higher tax brackets.

The large effects of steady inflation on average and marginal Federal income tax rates are shown in figure 2, prepared by Martin Bailey for the 1975 Brookings conference (Aaron, ed. 1976, pp. 291–319). A 10-year 100 percent inflation is assumed (roughly 7 percent a year), and both average and marginal tax rates are shown for families of four whose adjusted gross income remained constant in real terms over the period. The upward and leftward shift of the two curves shows both the addition of low-income families to taxable status—namely, those with incomes between $2,800 and $5,800 in 1975 dollars—and the increased tax burdens on families already taxable in 1975. A family at the 1975 median income of $13,500, for example, would have its marginal tax bracket raised from 22 percent to 32 percent if its real income remained constant and to 36 percent if it participated in the 10-year economic growth assumed by Bailey so that its real AGI increased to $17,000. It should be stressed that figure 2 was constructed to represent only families whose income is mainly from wages and salaries. It would also apply to taxpayers with property income if the Federal income tax base were indexed for inflation, but it cannot show the complex effects of inflation on such families in the absence of measurement indexation.

FIGURE 2.—Federal individual income tax rates and tax as a percentage of income for a family of four, before and after 10-year, 100 percent cumulative inflation, by real adjusted gross income, 1975 tax laws.[a]



Sources: Median income from, or derived from, *Economic Report of the President, January 1976*, p. 194. Tax share calculated from Internal Revenue Code, individual income tax rates for 1975.

a. The effect of the $30-per-person tax credit enacted in 1975 is disregarded in the steps, but is included in the smooth curves. Deductions are assumed as either $1,900 or 16 percent of adjusted gross income, whichever is greater. Exemptions are $750 per person.

b. The figure of $17,000 for median family income after 100 percent inflation is the author's estimate of 1985 median family income.

Source: Martin J. Bailey, "Inflationary Distortions and Taxes," in Aaron, ed. (1976), p. 298.

Implementation

Vito Tanzi concluded his survey of foreign experience with income tax inflationary adjustments by saying: "[I]ndexing the rate structure does not present serious administrative problems. The tax authorities can easily produce new tax tables, and taxpayers can easily compute their tax liabilities with the new tables" (Aaron, ed. 1976, p. 226). Three basic choices are involved in any structural indexation plan.

The first concerns the particular items to be adjusted. While, in principle, all fixed dollar amounts in the U.S. tax code should be indexed, a less comprehensive plan that included only the most important ones, such as personal exemptions, zero bracket amounts, and the tax rate brackets, would come close to the goal of full structural indexation (Sunley and Pechman, 1976, p. 154).

The second choice concerns the price index to be used. A thorough discussion of the alternatives is given by Denison in his paper for the 1975 Brookings conference (Aaron, ed., 1976, pp. 233-61). His two general conclusions are that a single index should be used for all taxpayers (a judgment that occasions little dispute), and that the price index should be the implicit deflator for national income (a choice that does not command universal support). Denison's case for the national income deflator rests on the argument that it "corresponds most closely to the definition of income that is subject to the personal and corporate income taxes" (Denison, 1976, p. 248). His critics, who opt for a consumption price index, stress its closer correspondence to what they perceive to be the basic purpose of an income tax—namely, to relate tax burdens to each family's consumption opportunities (Aaron, ed., 1976, pp. 264-66). Whatever the theoretical advantages of different price indexes, the quantitative differences among them during the last 40 years in this country are not large enough to make this choice a major policy issue (Denison, 1976, pp. 254-58).

A more important policy question concerns the way in which other tax changes should affect a structurally indexed income tax. Specifically, should an increase in sales taxes be considered a price increase to be included in the index by which the nominal income tax structure is to be adjusted upward? The answer, it seems clear, is no. A price increase, by definition, is an increase in the cost of a given quantity of a product of unchanged quality. A sales tax increase, in contrast, is, or at least should be, accompanied by an increase in the quality of government services provided. It is, in effect, a surrogate private price increase substituting for a public goods price increase that is either impossible or too costly to collect. As such, its treatment in any consumer price index should be subject to special scrutiny, and for many purposes, special treatment. In the present instance, such surrogate price increases should be excluded from the calculations to be made. To do otherwise would blunt the purpose of sales and excise taxes by granting to Federal income taxpayers an adjustment for price increases that have not occurred. If these arguments are accepted, Denison's choice of a price index is the better one. The implicit deflator for national income excludes indirect business taxes whereas the Consumer Price Index (CPI), for example, includes them. The CPI, of course, could be adjusted to exclude sales taxes also, but that would require an explicit tax policy decision that might be hard to make.

The third basic choice concerns the manner in which fluctuating price levels are to be built into the structural indexation system. If taxpayer compliance costs are to be minimized, inflation adjustments must be incorporated both into the withholding tax tables sent to employers and into the Federal income tax forms sent to individual taxpayers. The price level adjustments used, therefore, must be based on the latest data available in time for the preparation of these tax forms. In Canada, which has had comprehensive structural indexation in operation since the beginning of 1974, the adjustment factor used is the ratio of the consumer price index during the 12 months ending September 30 of the year preceding the tax year to the value of the index in the corresponding period a year before that. In other words, withholding tax tables for the tax year 1979 are based on the average October 1–September 30 consumer price increase between 1976–77 and 1977–78.

This is a time lag of considerable size, but reductions in it cannot be achieved without cost. It might be that a cut-off date somewhat later than September 30 could be used, but the price data must be compiled and made available to the IRS and the withholding tax tables must be constructed, printed, and distributed to employers in time for the preparation of payrolls in January of the following year. Clearly, there is not much room for any significant shrinking of the Canadian adjustment time lag as far as withholding tax tables are concerned. Final tax rate tables, however, need not be based on the same price adjustment factor as the withholding tables. For example, whereas 1979 withholding tables would be based, as indicated, on the 1976–77 to 1977–78 average rate of price inflation, the tables to be used by taxpayers in computing their final 1979 tax liabilities, due on April 15, 1980, could be based on the 1977–78 to 1978–79 price increase. The advantage of this plan would be the use of a relatively current price adjustment factor for each tax year—i.e., one based on the actual rate of inflation

during the last quarter of the preceding year and the first three quarters of the tax year itself. The disadvantage, if indeed it is one, would be an increase in over-withholding whenever consumer prices are rising significantly.

Several other features of the Canadian plan are notable. One is the choice of the Consumer Price Index as the adjustment factor. This had the advantage of general public familiarity and of availability of the data on a monthly basis. A national income deflator, in contrast, would be a more general measure of price inflation but would be available only on a quarterly basis and would not be widely understood without extensive discussion of its qualifications in the media. Choice of the CPI, however, forced explicit consideration of the treatment of indirect taxes. Account was taken of the strong case for excluding such taxes from the price index to be used, but this adjustment was rejected as too complicated in a federal country with significant interprovincial indirect tax burden differentials (Allan, Dodge, and Poddar, 1974, p. 358). Where this rationale has less force, as in Denmark and the Netherlands, indirect taxes and price subsidies are both excluded from the tax adjustment index (Tanzi 1976, pp. 219–20). In this country, the Canadian federalist rationale would apply to State and local retail sales taxes, but it would not, and should not, be applied to any value-added, or other sales, tax levy that the Federal Government might enact in the future.

Use of an annual, rather than a monthly, price index ratio as the adjustment factor seems desirable to eliminate short-run priced distortions. However, consideration could be given to an intermediate period, such as a quarter or half year. Finally, structural indexation should in principle be applied to price level changes in either direction. The possibility of a general price level reduction over any extended period may appear to be too remote to be taken seriously. However, the time to incorporate adjustments for such changes in the income tax law is before a need for them arises and entrenched interests in their absence have been created.

Strengths and Weaknesses

Canadian experience with structural indexation indicates its administrative feasibility. There has also been time for at least a preliminary assessment of its effects on different income groups. A study by Jarvis and Smith (1977), for example, shows that indexing of both exemptions and tax brackets had an important effect on average tax rates between 1973 and 1975. As table 9 indicates, exemption and deduction indexing reduced average tax rates by 1.1 to 2.7 percentage points (column 1), depending on the taxpayer's real gross income and number of dependents. Tax bracket indexing reduced tax rates by 1.7 to 3.6 percentage points (column 2). These effects may be compared to the impact inflation would have had on average tax rates in the absence of structural indexation (column 3). Two general effects stand out. One is the greater effect of inflation on the tax rates of larger sized families. The other is the similarity in the tax rate increases experienced by low- and high-income taxpayers. This means, of course, a larger relative tax increase for low-income families.

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TABLE 9.—1973–75 CHANGES IN AVERAGE CANADIAN INCOME TAX RATES

Real gross income (1954 dollars): Exemptions	Change resulting from—		
	Structural indexation of—		Inflation in unindexed income tax system
	Deductions and exemptions	Tax rate brackets	
	(1)	(2)	(3)
$3,000:			
2	−0.0244	−0.0356	0.0266
4	−.0251	−.0353	.0295
6	−.0268	−.0190	.0314
$5,000:			
2	−.0208	−.0231	.0175
4	−.0224	−.0227	.0211
6	−.0243	−.0277	.0253
$7,000:			
2	−.0139	−.0210	.0278
4	−.0160	−.0195	.0276
6	−.0183	−.0185	.0284
$10,000:			
2	−.0130	−.0209	.0387
4	−.0150	−.0184	.0379
6	−.0170	−.0167	.0393
$15,000:			
2	−.0111	−.0242	.0315
4	−.0128	−.0239	.0326
6	−.0146	−.0236	.0335
$20,000:			
2	−.0114	−.0219	.0267
4	−.0108	−.0212	.0284
6	−.0115	−.0205	.0301

Source: Jarvis and Smith (1977), pp. 211 and 214.

Structural indexation of the income tax, then, deserves serious consideration as one way to keep inflation from raising Federal tax burdens on people with constant real incomes. Since its chief competitor is discretionary congressional action aimed at the same goal, the choice raises some fundamental questions about government performance in the modern world. Would discretionary tax cuts be made in time, in the right amounts, and for the right people? Would an automatically adjusting system help or hinder the achievement of society's desired allocation of resources between the public and private sectors? Would structural indexation strengthen or weaken our ability to control inflation and minimize unemployment? Would structural indexation strengthen or weaken intergovernmental fiscal relations?

There are no easy answers to any of these questions. In their analysis of Federal tax policy between 1960 and 1975, for example, Sunley and Pechman (1976) show that periodic tax reductions during that period more than offset, on the average, the increase in average tax rates that inflation would otherwise have produced. In 1960 tax liabilities were 11 percent of total personal income subject to tax (what Sunley and Pechman call adjusted personal income) and would have been 16 percent in 1975 had no changes been made in the 1960 income tax law (Sunley and Pechman 1976, p. 165). If the Federal income tax had been structurally indexed for inflation during the period, tax burdens would have been 12 percent of adjusted personal income in 1975 (assuming no discretionary tax reductions during the period), the increase from 1960 reflecting the growth in real personal income between the two years. In fact, however, individual income tax liabilities were only 11 percent of adjusted personal income in 1975. Discretionary tax reductions, then, had more than compensated Federal

income taxpayers for inflation, and compared to structural indexation these reductions had favored low-income groups relative to those with high incomes (Sunley and Pechman, 1976, pp. 157–61).

The relevance of the Sunley-Pechman analysis to the question at issue is debatable. During most of the period covered, consumer prices were rising at rates well below 5 percent a year. Most of the tax reductions made were not, therefore, primarily in response to the upward push of inflation on tax rates. Moreover, the best example of an inflation-stimulated discretionary tax reduction, the Revenue Act of 1978, was significantly less progressive in its vertical incidence than were the reductions enacted between 1960 and 1975 (Okner, 1979). Whether the 1978 Act represents a one-time adjustment to past overly progressive tax burden reductions, or whether it sets the tone for discretionary income tax cuts in an inflationary economy cannot now be known. Its occurrence, however, clearly increases the risks that discretionary tax burden adjustments to inflation will be less to the liking of liberals than would automatic inflationary adjustments.

Opportunities to lower income tax rates periodically are not something that politicians will surrender easily. Many fiscal economists also like them because tax reform policies are easier to sell when their redistributional effects can be sweetened by a general reduction in tax burdens. There are, however, some economic costs attached to these obvious political benefits. When inflation is running at double-digit rates, frequent tax reductions will be called for and much congressional time and effort may have to be devoted to the specific design of each tax change. Structural indexation would allow the Ways and Means and Finance Committees to devote their attention to other matters. In addition, frequent tax reforms would create business uncertainties about future tax burdens and might well have an adverse impact on the level of investment.

Concern has frequently been expressed about the perverse fiscal flexibilities that might be built into an inflation-adjusted income tax structure. In particular, tax revenues might not expand in response to accelerating inflation as rapidly under an indexed system, and that might weaken the economy's ability to keep inflation under control. The existence of such a possibility must be recognized, but it is only part of a much broader picture. The built-in stabilizing, or destabilizing, powers of a structurally indexed income tax system vary significantly with the time lags that characterize the system, with the time pattern of interactions between price level changes and the incidence of excess unemployment, and with the kind of inflation the country is experiencing. Demand-pull inflation is indeed best combated by the income tax rate increases that an unindexed tax system would automatically produce. Cost-push inflation, in contrast, may be exacerbated by tax burden increases that induce workers to demand still greater wage rate increases. The question is basically an empirical one that can be answered precisely only for particular structural indexation plans and for particular kinds of economic instability. Addressing the problem on a more general level, Pierce and Enzler (1976) used a macroeconometric model to simulate response patterns to outside shocks in the U.S. economy both with our present tax system and with an inflation-adjusted one. Their conclusion was that "indexing the income tax system will not produce significantly greater economic

instability than already exists" (Pierce and Enzler, 1976, p. 187). Similar results were obtained for the Canadian economy by Bossons and Wilson (1973).

Still another problem is that the tax revenue increases produced by an unindexed income tax structure may not even serve as a built-in dampener to demand-pull inflation. This would happen if higher, automatically generated, revenues stimulated higher government spending, as some fiscal experts believe to be the general case. This in turn raises the basic question of the relative impact on the size of government of indexed and unindexed income tax structures. If there is broad popular support for a public sector of stable size, will the additional income tax revenues produced by inflation under an unindexed structure be returned to the people by tax rate reductions, as they should be, or will they be kept and spent in the public sector? There is no definite answer to that question, but current interest in tax and expenditure limitations suggests a growing public disenchantment with the recent record of discretionary tax reduction policies.

Critics have also stressed the risk that structural indexation would weaken public support for anti-inflationary government policies. Unlike measurement adjustments, which are required to define the correct income tax base, structural adjustments are an attempt to eliminate some of the undesirable effects of inflation. By succeeding, they might well make it somewhat easier to live with inflation. At the same time, they are only one of many adaptations to inflation that have already occurred, all of which either establish entrenched interests in the continuation of inflation or weaken individual willingness to incur short-term costs in order to reduce it in the long run. Union members who have added cost-of-living adjustment clauses to their wage contracts, investors who have shifted from stocks and bonds to gold and other real assets, businesses that have shifted from equity to debt capital, and homeowners who have acquired houses with low downpayments and high interest rate mortgages are all examples of the strong adaptive powers of the economic system. The real question, therefore, is whether or not structural indexation of the Federal income tax would materially strengthen the inflation-perpetuating forces already building in the society. The best place to look for an answer to this question is Canada. Structural indexation has been in operation there for five years, and there is no evidence that it has had any effect on Canadian anti-inflationary policymaking.

Finally, there are important questions about the impact of structural indexation of the Federal individual income tax on State and local governments and their relations to Washington. Again the answers are mixed (ACIR, 1976, pp. 53–66). States that base their own income tax on Federal income tax liabilities would participate automatically in all of the revenue effects of Federal indexation, while States that allow deductibility of Federal income taxes from their own bases would experience opposite effects. In 1975 three States fell in the first category and 16 in the second (ACIR, 1976, pp. 27–36). The net burdens of State and local taxes that are deductible from the Federal income tax base, which have been falling as inflation has pushed taxpayers into higher and higher Federal marginal tax rate brackets, would fall less rapidly under indexation. All State and local governments would face greater revenue constraints if the Federal

Government reacted to its reduced revenues under indexation by cutting back Federal grants-in-aid. On the other hand, if Federal indexation moderated public opposition to government growth, State and local officials would be freer to raise funds from their own sources.

Summary

Structural indexation raises many hard-to-answer questions about government performance in the modern world. As long as high uncertainties accompany a decision either to adopt structural indexation or not to adopt it, no broad public consensus can be obtained for either policy option. Under such circumstances only experimentation can hope to resolve the conflicting arguments. The most relevant evidence in this case is provided by Canada's experience with structural indexation.

Though only five years have passed since its enactment, the plan appears to be working well and not to have generated any of the ill effects that critics of structural indexation fear.

Tax Policy Options

When strong inflationary pressures arise and persist, as they have in this country in recent years, Federal tax policymakers have four broad options. They can do nothing and hope that the inflationary pains go away quickly. They can adjust the income tax base, by mensural indexation, so that it continues to reflect accurately taxpayer abilities to pay in spite of rising price levels. They can enact a plan of structural indexation so that income tax burdens on stable real incomes do not rise steadily as inflation continues to push taxpayers into higher and higher tax rate brackets. Or they can enact both changes.

Each option has its benefits and costs, its risks and rewards. Choosing the first option would be easy under inflationary prospects much lower than they are today. Choosing the last option would be essential under much higher inflationary prospects. Such easy solutions, however, are not the stuff of which good tax policy is made. The Federal income tax system may well be approaching a critical watershed beyond which in one direction lies improvement and continued well-being and in the other retrogression and intensified ill health. Choosing the right road may make all the difference.

The Status Quo Option

If over the next few years the Federal income tax system is not indexed for inflation, and if current rates of price increase do not decline appreciably, Federal tax policymakers will face four major sets of problems.

1. The enactment of tax base indexation will become increasingly difficult as more and more people adjust to its absence and acquire vested interests in the continuation of the status quo.

2. Congressional consideration of both income tax reductions and reform will become more difficult, partly because it will be harder to discern exactly where the true burdens of the income tax system lie,

and partly because taxpayer group pressures for special favors to offset perceived inflation-created excess burdens are likely to increase.

3. Beset by the obvious inequities of a nominal money income tax in an inflationary world, the public may lose confidence in the income tax as the main source of Federal revenue and shift its support to other alternatives.

4. Public loss of confidence in the income tax might spill over to the Federal Government as a whole, strengthening the tax and expenditure limitation movement and focusing it more sharply on Washington.

The familiar adage that "old taxes are good taxes" applies here as well as elsewhere. Excess inflationary tax burdens can be avoided in varying degrees, and people can be expected to pursue these opportunities with vigor. As they do so they increasingly put themselves into positions where they stand to lose from the adoption of tax base indexation. Money interest rates, for example, have already risen high enough to create considerable difficulty for designers of an equitable mensural indexation plan, as will be seen below. The first step in what is a rather insidious process is, as Martin Bailey has cogently put it: "When inflation increases tax discrimination, the expectation of further inflation will cause resource shifts that convert the initial inequity into inefficiency" (1976, p. 309). These inefficiencies may go largely unnoticed by the general public, or if they are noticed, may not be attributed to their true causes. Even if they are so attributed, the tax reforms needed to eliminate them—in this case tax base indexation—will create a new set of inequities that stand as a political barrier to successful enactment of the needed tax law changes. Old taxes need not, of course, be the only taxes. What the adage stresses is that tax reforms should be designed to minimize the windfall gains and losses they create and should not be undertaken at all unless their long-run benefits clearly outweigh any inescapable short-term costs.

Making intelligent tax policy in an inflationary world with an income tax of the conventional kind is like trying to comb one's hair in a room of distorted mirrors. No matter how hard one looks, the picture is misleading, and doing what looks right may in fact be the wrong thing to do. The large differences discussed earlier between nominal money income and price-adjusted income for different groups and kinds of income indicate how much obfuscation is likely to be produced. Another good illustration is the difficulty involved in determining whether, and to what extent, taxation of nominal money income during inflation increases the progressivity of the Federal individual income tax. In general, as already noted, such an income tax system imposes an annual capital levy on wealth owners at a tax rate equal to the rate of inflation times the owner's marginal income tax rate. If this were all there were to the picture, the result would be a progressive surtax on a form of income that is already, except in the lowest income ranges, progressively distributed in relation to total personal income.

While such an addition to the present income tax would therefore be broadly progressive in its vertical incidence, there are enough exceptions to this general pattern to make its true dimensions highly uncertain. In the first place, some kinds of personal wealth, such as homes and consumer durables, are virtually income tax free, and the

inflationary capital levy makes these forms of wealth relatively more attractive. Current owners enjoy untaxable capital gains and the Nation's resources are diverted into inferior uses. Secondly, some owners of taxable capital assets are able to avoid the capital levy burdens by postponing any taxable realization of accrued capital gains and losses. Income tax inequities may be reduced by these reactions, but the cost is an increase in lock-in effects and a decrease in capital market efficiency.

The final, and perhaps most important, set of exceptions is created by whatever tendencies nominal rates of interest have to rise in response to anticipated inflation. As discussed above, excess inflationary tax burdens on creditors and excess subsidies to borrowers are offset when the following relation prevails between market rates of return under inflationary and noninflationary conditions:

$$r^* = r' + g/(1-t),$$

where r^* = the rate required under inflationary conditions,
r' = the rate prevailing under noninflationary conditions,
g = the rate of general price inflation, and
t = the marginal income tax rate of creditors and debtors.

In years dominated by unanticipated inflation, as Tanzi's data suggest was the case in 1974 (table 7 above), actual market rates of return are likely to be well below the required r^* levels, and few people are able to escape the inflationary tax surcharge. In years when anticipated inflation rates are equal to or exceed actual rates, however, there will be some critical marginal income tax rate, t', for which actual and required market rates of return are equal. Lenders and borrowers in that tax rate bracket would not be penalized or subsidized by the use of an unindexed income tax base. Lenders in lower tax rate brackets would be rewarded by the operation of that kind of tax system, and those in higher tax rate ranges would be penalized. Opposite effects would apply to borrowers.

Under present conditions inflation and the Federal income tax may be on a collision course. If inflation gives way, the income tax will survive. If inflation does not give way, the income tax may be badly scarred. This is because the absence of base indexation creates serious inequities and inefficiencies in the income tax which are absent from some of its major competitors. These more attractive alternative sources of Federal revenue include a self-assessed personal consumption or expenditure tax, such as has recently been discussed at length in the United Kingdom and Sweden and was the subject of a Brookings Institution conference of experts in 1978 (Institute for Fiscal Studies, 1978; Sven-Olof Lodin, 1978; and Joseph A. Pechman, ed., 1980), a value-added tax, or even the payroll tax for social security. Failure to index the income tax base, in short, both strengthens the case for adopting a Federal value-added tax and weakens the case for financing some part of social security benefits from the general fund.

The ultimate risk of a status quo policy is that it will increase public disenchantment with government and, doing so, strengthen such nascent constitutional amendment movements as those seeking to require a balanced Federal budget or limitations on expenditure growth. By failing to enact a simple plan of structural indexation for

the Federal individual income tax, Congress may give unintended comfort to the framers of much more stringent rules of government behavior.

These possibilities are perhaps too remote to be given prime attention at this point. What seems a more imminent prospect is the undermining of the income tax as the main source of Federal Government revenue. A status quo policy will surely intensify public pressures for special tax relief for those kinds of income most subject to inflationary distortions. More accelerated depreciation allowances, more generous investment tax credits, some exclusion of ordinary saving from the income tax base, and greater exclusion allowances for long-term capital gains are only the most obvious of many possibilities. Such ad hoc "reforms" are not likely to improve the overall equity and efficiency of the Federal income tax system. Lacking sense and direction, they make a mockery of the tax and stimulate the search for better alternatives.

Tax Base Indexation

Shifting all taxable incomes to a price-adjusted basis, desirable as it is from a theoretical point of view, means overcoming several major practical difficulties. The first barrier is the general belief, or at least hope, that inflation is a temporary disorder which will, without extraordinary measures, be brought under control. Even those who are optimistic about such possibilities, however, may still support mensural indexation because, as shown above, its effects on taxable business incomes do not stop with the elimination of inflation. The existence and importance of these after-effects provides a strong argument favoring the adoption of tax base indexation even if inflation is expected to abate significantly in the near future.

The main problem with base indexation, even if enacted in its simplest form, is that it would make the tax law more complicated. Failure to enact it, however, would also make the tax law more complicated, as Congress reacted to taxpayer pressures discussed in the preceding section. The real question is whether the incremental administrative and compliance costs of mensural indexation are overbalanced by its incremental benefits. The precise nature of the complexities that base indexation would add to the tax code cannot be foreseen at this point. The basic measurement principles are clear enough, but there are many different variations and refinements that could be used and might indeed be essential to make the proposal politically salable.

FINANCIAL ASSETS AND LIABILITIES

One important feature of the plan's design would be minimization of windfall gains and losses resulting from its enactment. This, in turn, counsels careful attention to the treatment of financial assets. Market interest rates have already adjusted to some degree both to inflation and to the tax distortions produced by the present income tax system. The larger these adjustments, the stronger the case for restricting mensural indexation to new financial asset contracts. This would require a clear set of rules distinguishing existing from new contracts.

One important choice would be the treatment of outstanding mortgages on homes put on the market for sale. High current interest rates are already providing a strong incentive for the transfer of these mortgages to the buyer whenever feasible, and inflation indexing could significantly increase those incentives unless a transferred mortgage were considered a new contract for tax purposes.

Tax base indexation could be applied to new debt issues in two different ways (Bossons 1974):

1. All new debt issues could be required to be indexed for inflation in the standard way discussed above. Lenders would then deduct from their nominal interest income each year the product of that year's inflation rate and the outstanding principal of the debt instrument; borrowers would add the same sum to their taxable income (or equivalently compute their deductible interest expense by subtracting the inflation adjustment factor from nominal interest costs).

2. New contracts issued as "inflation-indexed debt instruments" could qualify for special tax treatment. A debt contract of this kind would be one that divided interest payments into components: (*a*) A fixed amount of money; and (*b*) a variable amount equal in each period to the product of that period's inflation rate and the outstanding principal. The special tax treatment would make the variable component nontaxable to the lender and nondeductible by the borrower. The second plan has the advantage of making tax base indexation for financial contracts optional rather than mandatory. It also gives the tax advantages of indexation to lenders only if all of the inflation risk is passed to borrowers. Since borrowers are normally in a better position to hedge those risks by buying suitable assets, this allocation of inflation risks makes sense economically.

A more drastic modification of the basic mensural indexation plan would be to omit financial assets and liabilities entirely. Such a truncated set of tax base adjustments has serious economic and fiscal drawbacks. It would be less equitable and efficient than a comprehensive plan, and it would almost certainly be more complex to administer and comply with. It may, however, be the only politically feasible form of tax base indexation (Wetzler, 1979). It would, for one thing, significantly understate business taxable income, much more for some companies than for others. Its resource-allocation effects would therefore be adverse. As far as the equitable tax treatment of corporate source income is concerned, its deficiencies at the corporate level might be offset at the individual level by suitable adjustments in the capital gains tax. This is because under a comprehensive Haig-Simons concept of income there is no justification for a separate corporation income tax as long as capital gains and losses are fully taxed on an accrual basis (McLure, 1979). Making appropriate adjustments in the capital gains tax, however, is a formidable assignment.

A truncated base indexation plan would require both clear distinctions between assets that were eligible for indexation and those that were not, and a set of rules (which might have to be very complex) to prevent taxpayers from converting noneligible assets into eligible assets and from combining eligible assets and noneligible liabilities. Borrowing to purchase indexable corporate shares would be an obvious loophole. Given the fungibility of debt, any attempt to allocate

specific liabilities to particular assets would introduce many arbitrary distinctions into tax law. As a feasible alternative, Bossons has proposed that taxpayers be allowed to use a full capital gains cost basis adjustment factor only when they have no debt liabilities, and that they be required to reduce that factor in proportion to such outstanding debt (1979, pp. 151–152). This proposal would require all shareholders wishing to index capital gains and losses for inflation to file a suitable balance sheet of investment assets and liabilities, including, in Bossons' plan, principal residences and mortgage debt but not short-term liquid assets.

CAPITAL GAINS AND LOSSES

Another major practical difficulty faced by designers of tax base indexation plans is to determine what other adjustments in current tax law should be made at the same time. These would include elimination of any features in the present code that were put there mainly to counteract distortions created by failure to index the tax base for inflation. In addition, if the introduction of base indexation were judged to affect the vertical equity of the Federal tax system adversely, these side effects could be dealt with by suitable changes in the tax structure.

The tax treatment of capital gains and losses provides an excellent example of the kinds of policy issues that would be raised by the enactment of tax base indexation. Some reduction in the present 60 percent exclusion for long-term capital gains would be seen by many as an essential accompaniment of capital asset cost basis adjustment for inflation. How far such reductions should be carried involves a delicate balancing of equity considerations (which favor full taxation of capital gains on an accrual basis), certainty, liquidity, and simplicity tax goals (which favor taxation on a realization basis), and capital market efficiency targets (which may require lower tax rates on realized capital gains than currently apply to other kinds of property income).

The empirical studies of Feldstein, Slemrod, and Yitzhaki provide important evidence of the sensitivity of corporate shareholders to tax considerations. One problem faced by researchers in this area is the lack of suitable data sets on which to base analyses of the effects of tax changes on the realization of capital gains and losses. The only systematic evidence about the use of the proceeds from the sale of capital assets is the national survey concentrating on high income households made for the Board of Governors of the Federal Reserve System in 1963–64 (Projector and Weiss, 1966). Feldstein's and Yitzhaki's analysis of these data (1978) shows that corporate shareholders would react to higher tax rates on realized capital gains by selling less stock, particularly when their purpose was to reinvest the proceeds in other financial assets rather than to spend them. Because of the small number of households in the Feldstein and Yitzhaki subsample and their high concentration in the wealthiest groups, the quantitative estimates obtained should be viewed only as broad indicators of probable tax effects (1978, p. 30). Even in this limited role their message is a striking one. Simulating the effects of full taxation of realized capital gains at ordinary income tax rates in 1963, for example, Feldstein and Yitzhaki found that half of those who sold in that year

would not have sold at all and that the value of corporate stock sales would have fallen to 30 percent of its 1963 level (1978, pp. 30–33).

The other main source of data is the Internal Revenue Service—Treasury Department special 1973 sample study of capital asset transactions. This covers a much larger group of corporate shareholders, but switching from one financial asset to another cannot be distinguished from sales made to finance consumption. Feldstein, Slemrod, and Yitzhaki's analysis of these data (1978) produced results similar to those obtained from the 1963–64 survey. By their calculation full taxation of realized capital gains would have reduced corporate stock sales in 1973 from $29 to $17 billion and would have reduced capital gains tax revenues from $5.4 to $2.9 billion. These dramatic results stimulated considerable debate in the profession (Slemrod and Feldstein 1978; Tax Notes August 9, 1978; Feldstein 1978; Nordhaus 1978). Whether increasing tax rates on realized capital gains would actually reduce government revenues cannot yet be predicted with confidence. That there would be significant effects on the number and amount of capital asset sales, however, seems highly probable.

The taxation of realized capital gains, then, should be designed with close attention to investor lock-in effects. One solution is to keep effective tax rates low enough to avoid significant impediments to the switching of capital asset investments. Another would be to tax realized capital gains at full ordinary rates but to minimize lock-in distortions by tax law changes that reduce the gains to be obtained by deferring realizations. Taxation of accrued gains whenever property is transferred by gift or at death is one such policy that has been discussed for many years but never enacted. Another, also under discussion for years but usually regarded as prohibitively expensive administratively, would be to impose on realized long-term capital gains an interest charge designed to approximate the taxpayer's gains from tax deferral. Bucovetsky (1977) has recently proposed a plan for doing this that he regards as administratively feasible.

Adjusting the orignal cost bases of capital assets for inflation would greatly expand the amount of accrued capital losses and hence would require a reassessment of current tax policies concerning the deductibility of realized net capital losses against ordinary income. The standard equity rule is that capital losses should be deductible for tax purposes to the same extent that capital gains are taxable. The problem with taxation on a realization basis is to prevent taxpayers from realizing all capital losses immediately and deferring capital gains for extended periods. The revenue effects of different treatments of capital losses are substantial. Table 10 gives Feldstein and Slemrod's estimates of the revenue and distributional effects of different tax treatments of capital gains and losses, computed without taking into account any investor reactions. The first two lines in the table simply repeat the estimates given earlier in table 5 (lines 3 and 4) showing the impact revenue effects of keeping the 1973 exclusion and loss offset limitation rules and taxing realized gains and losses on a nominal and on a price-adjusted basis.

TABLE 10.—TAX LIABILITIES WHEN CAPITAL GAINS ARE TAXED LIKE ORDINARY INCOME[1]

[Dollar amounts in millions]

	Adjusted gross income class								
	Less than zero	Zero to $10,000	$10,000 to $20,000	$20,000 to $50,000	$50,000 to $100,000	$100,000 to $200,000	$200,000 to $500,000	More than $500,000	All
1. Tax on nominal capital gains	$1	$−5	$83	$80	$159	$215	$291	$374	$1,138
2. Tax on real capital gains	−0	−25	−34	−52	58	141	235	337	661
3. Tax on nominal capital gains; no loss limit	−0	−7	−6	−31	91	191	288	372	897
4. Tax on real capital gains; no loss limit	−1	−38	−94	−259	−97	72	209	325	117
5. Tax on nominal capital gains with all gains treated as short-term gains	9	30	109	406	469	562	676	804	3,065
6. Tax on real capital gains with all gains treated as short-term gains	6	−8	14	174	285	421	569	736	2,196
7. Tax on nominal capital gains with all gains treated as short-term gains; no loss limit	7	19	44	183	340	514	665	799	2,571
8. Tax on real capital gains with all gains as short-term gains; no loss limit	4	−38	−112	−216	14	302	523	715	1,193

[1] All calculations relate to capital gains on corporate stock sold in 1973.

Source: Feldstein and Slemrod, "Inflation and the Excess Taxation of Capital Gains on Corporate Stock," National Tax Journal, vol. 31 (June 1978), p. 114.

The next two lines in table 10 (lines 3 and 4) show the substantial effects of removing the 1973 limits on loss offsets while retaining all other features of that law. Lines 5 and 6 then show the effects of taxing capital gains and losses—on a nominal and a price-adjusted basis respectively—at full tax rates while retaining the 1973 limits on capital loss offsets. Finally, lines 7 and 8 show the same pair of comparisons for full taxation plus full loss offsets. Clearly, the treatment of capital losses has revenue implications of major magnitudes.

If capital gains and losses were indexed for inflation, it would be difficult to avoid either arbitrary limits on capital loss offsets against ordinary income or undue freedom for investors to realize losses and defer gains. Both kinds of inequity could be minimized under a plan recently proposed by Bossons (1978, 1979) that would restrict fully deductible losses to the amount, if any, by which realized net losses exceeded total accrued net gains in the investor's portfolio. If realized net losses were less than accured gains, taxpayers would be given the option of carrying the net losses forward or of offsetting them against accrued gains by writing up the cost basis of accrued-gain assets by the amount of the net realized losses. When realized net losses exceeded accrued net gains, all of these gains would be eliminated from taxable status by offsetting the losses against them and the remaining net losses would then be fully deductible from ordinary income.

INDEXATION FOR FUTURE INFLATION ONLY

Another modification of tax base indexation that has been given serious consideration would be to adjust only for inflation that occurs

after the date of enactment of the policy change, but not for any inflation that had already occurred (Aaron, ed. 1976, p. 151; Wetzler, 1979). In essence, this is simply a combination of the first two broad policy options—a status quo choice for the short and intermediate run and full mensural indexation for the long run. Politically this plan may be more salable than immediate indexation, and it does phase in the inevitable administrative and compliance complexities gradually. It might also, however, suffer from some of the worst features of both possible worlds. Indexation of capital gains and losses for future inflation only, for example, would severely undermine the case for tighter tax treatment of that kind of income any time in the near future. The result might be continuation, or even liberalization, of the present favorable exclusion rules for long-term capital gains while inflation indexation gradually became more and more effective for portfolio investors. Many of the unfortunate consequences of status quo policy maintenance, in short, might become so entrenched during the early phases of the future-inflation-only indexation plan that their elimination later would be impossible.

CONCLUSIONS

Tax base indexation, admittedly, is a policy option of considerable complexity. So also, however, is the alternative status quo option, and it does not have the solid theoretical foundation that supports tax base indexation. If a shift of options is to be made, it should be done sooner rather than later because persistent inflation tends to produce stronger and stronger pressures opposing the adoption of base indexation. Foreign experience shows both the many difficulties created by delay and the complexities resulting from ad hoc adjustments to the inflationary distortions plaguing a nominal money income tax (Fishlow, 1974; Lent, 1975, 1976; Petrei, 1975). What has yet to be put to the test of experience is a systematic plan of tax base indexation. On its development and implementation may well depend the future of the income tax in this country.

Structural Indexation

Indexing the structure of the Federal individual income tax for inflation would not give rise to any major administrative or compliance problems. Whether the performance of the Federal Government, and of the economy in general, would be improved thereby can be debated at length but cannot be proved either way. Three broad policy options may be distinguished.

TAX RATE BRACKET SIMPLIFICATION

If Congress continues its past practice of making periodic reductions in income tax burdens to offset the expansionary effects of inflation on Federal revenues, a major policy issue is likely to be the number and size of the tax rate bracket used to determine individual income tax liabilities. In the Revenue Act of 1978, partly in response to inflation, the 26 brackets then existing (including the zero rate bracket) were widened and reduced to 16. Further reductions in that number would both moderate the relentless upward pressures of inflation on

real tax burdens and simplify the task of adjusting the remaining bracket limits upward periodically in line with general price increases. In the model comprehensive income tax proposed in the Treasury's "Blueprints for Basic Tax Reform," for example, there were only three taxable income classes in addition to the zero rate bracket (1977, p. 162). For joint returns they were:

	Marginal Tax Rate
Taxable income bracket:	*Percent*
$0 to $4,600	8
$4,600 to $40,000	25
Over $40,000	38

These limits were defined for 1976 income levels and would be correspondingly higher in nominal dollars at present price levels.

ANNUAL INDEXATION

Two versions of full structural indexation were discussed earlier. Under each all tax rate brackets, personal exemption amounts, and any other important structural components stated in nominal dollars would be raised each year by the rate of inflation. The adjustment factor used would be derived for a period as recent as administrative considerations permitted. Under the Canadian plan, for example, the adjustment factor for the tax year 1979 would be the ratio of the Consumer Price Index for the 12 months ending September 30, 1978, to its average level in the period between October 1, 1976, and September 30, 1977. One version of this plan would apply the same correction factor to the withholding tax tables used in 1979 and to the final tax tables mailed to taxpayers prior to the April 15, 1980, deadline for the filing of their 1979 returns. The second version would adjust the withholding tables in the same way but use a more current adjustment factor—namely, the ratio of the price index for the October 1, 1978, to September 30, 1979, period to its corresponding 1977–78 value—for the final tax tables. By this means the adjustment lag could be shortened considerably, but over-withholding would be widespread unless short-term adjustments in withheld amounts were thought both desirable and feasible.

Choice of a suitable price index for either version presents no great problem. The chief contenders are:

1. The implicit price deflator for national income.
2. The implicit price deflator for personal consumption expenditures.
3. The fixed-weight price index for personal consumption expenditures.
4. The Consumer Price Index.

The main considerations in this choice, discussed above, are the breadth of price coverage desired and the treatment of indirect business taxes.

The price adjustment factor specified in an annual indexation plan need not be a single, mandatory figure. If some administrative or legislative discretion is thought desirable, but not as much as a status quo policy option would allow, the government can be given a range within which the adjustment multiplier must fall. The structural adjustment mechanism adopted in the Netherlands in 1971, for example,

specified the standard type of correction factor but allowed the Minister of Finance to adjust it downward by not more than 20 percent (Petrei, 1975, p. 543).

PERIODIC INDEXATION

Automatic structural indexation of the income tax could be put on a periodic, rather than an annual, basis. Changes in nominal structural components could be made whenever the selected price index had increased by stipulated amounts from some base period, such as 10 percent, 20 percent, 30 percent, and so on. This would tie the frequency of adjustment to the rate of inflation rather than to the calendar. One weakness of the plan is its failure to distinguish between the burdens of, say, a 20 percent inflation occurring in two or three years, and those of one spread out over a longer period.

How serious the tax distortions produced by slow but steady inflation may be is a difficult matter to judge Those who discount the importance of such cumulating effects can consider a periodic indexation plan that would trigger a structural income tax adjustment only in years in which inflation exceeded some minimum specified percentage rate. As long as inflation was kept at or below that minimum "bearable" rate, no tax adjustments would be made. In other years they would occur automatically and might be based either on the full rate of inflation then occurring or only on its excess over the minimum specified rate.

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INCOME TAXATION AND LABOR SUPPLY

By Harvey S. Rosen*

CONTENTS

I. Introduction

The last four decades have seen large increases in personal income tax rates. In 1939, a person with a taxable income of $3,000 faced a marginal tax rate of 4 percent. By 1976, someone with a similar real taxable income faced a marginal tax rate of 36 percent.[1] In addition, important changes in the size, composition and skill level of the labor force have been occurring: Between 1947 and 1976, the average number of hours worked per week decreased from 40.3 to 36.2. Between 1940 and 1978, the total labor force increased from 56.1 million to 101.5 million, and the number of females in the labor force increased from 14.2 million to 41.1 million. In the post-World War II period, the labor force participation rate of married women more than doubled, from 22.0 percent to over 46 percent (see table 1.1).

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[1] These calculations are based upon Tax Foundation, Inc. (1977, pp. 102–103). If the individual in 1978 were married to someone with zero income, the marginal tax rate would be 25 percent. Inclusion of the social security payroll tax would make the differential between 1939 and 1976 even greater.

TABLE 1.1[1]

Year	Total labor force[2]	Female labor force[3]	Married women (husband present) labor force participation rate
1940	56.1	14.2	----
	57.7	14.7	----
	60.3	16.1	----
	64.8	18.8	----
	66.3	19.4	----
1945	66.2	19.3	----
	60.5	16.8	----
	60.9	16.7	----
	62.1	17.4	22.0
	62.9	17.8	22.5
1950	63.9	18.4	23.8
	65.1	19.1	25.2
	65.7	19.3	25.3
	66.6	19.4	26.3
	67.0	19.7	26.6
1955	68.1	20.6	27.7
	69.4	21.5	29.0
	69.7	21.8	29.6
	70.3	22.1	30.2
	70.9	22.5	30.9
1960	72.1	23.3	30.5
	73.0	23.8	32.7
	73.4	24.0	32.7
	74.6	24.7	33.7
	75.8	25.4	34.4
1965	77.2	26.2	34.7
	78.9	27.3	35.4
	80.8	28.4	36.8
	82.3	29.2	38.3
	84.2	30.6	39.6
1970	85.9	31.6	40.8
	86.9	32.1	----
	89.0	33.3	----
	91.0	34.5	42.2
	93.2	35.8	43.0
1975	94.8	37.0	44.4
	96.9	38.4	45.0
	99.5	40.0	46.6
	101.5	41.1	----

[1] Source: Data for before 1970 are from Historical Statistics of the United States, and, after 1970 from Statistical Abstract of the United States 1978.
[2] Includes Armed Forces.
[3] Does not include the Armed Forces.

Has the Federal personal income tax system had a substantial impact on these trends in the labor supply behavior of Americans? Would various "tax reforms" that are currently being considered change their labor force decisions? How might such changes influence the economic organization of the family? The purpose of this paper is to discuss and evaluate the economic evidence on these issues. We begin by discussing in Section II the methodological framework used by economists to analyze labor supply decisions. Section III shows how this methodology has been implemented econometrically in order to estimate the effects of taxation on labor supply, and includes a critical discussion of the empirical work.

Sections IV and V, narrow the focus somewhat, and discuss the taxation of the family. Special attention is devoted to the tax treatment of married women, a group of growing importance in the labor force. The efficiency and distributional consequences of a number of ways for taxing the family are analyzed. Section VI examines a somewhat neglected topic, the impact of taxes upon dimensions of labor supply other than hours of work. These include time of retirement, intensity

of work effort, and educational decisions. A concluding section contains a brief summary and suggestions for future research.

II. Taxes and Hours of Work: Theoretical Framework

The purpose of this section is to explain how economists model individual labor supply behavior, and how taxes are incorporated into analysis. It begins by discussing the simple but useful case in which an individual decides how much to work in disregard of the labor supply decisions made by other family members. It then turns to the more general situation in which husbands and wives decide jointly how many hours each will work, if at all. The section concludes with an evaluation of the usefulness and adequacy of the theoretical model.

A. A Simple Model of the Work Decision [2]

From an economic point of view, the work decision is essentially a problem in the rational allocation of time. Given that the individual only has a certain number of hours in the day, how many should he or she devote to work in the market, and how many to leisure? [3] The individual derives utility from leisure, but to earn income, leisure time must be surrendered; i.e., work must be supplied. The individual's problem is to find just the right trade-off between income and leisure.

Formally, imagine that the individual's utility or satisfaction, U, is a function of his or her income Y, and hours of leisure L. He or she seeks to maximize the utility function

$$(1)\quad U=U(Y, L)$$

subject to the budget constraint

$$(2)\quad Y=w(T-L)+A,$$

where: w is the individual's net wage, T is the total number of hours available, and A is nonlabor income. Equation (1) states that the individual values both income and leisure, and equation (2) simply indicates that income is the sum of earned income (the wage (w) times hours of work (T−L)), plus unearned income, A.

To understand this model, it is crucial to note the role of the net wage as the cost of time. For every hour spent at leisure, the individual gives us w dollars—time is literally money. Note, however, that a "rational" individual generally will *not* work every possible hour, even though leisure is costly. Most individuals spend time on leisure to the extent that leisure generates utility that is valued in excess of its opportunity cost.

Imagine now that the individual has found his or her utility maximizing combination of income and leisure, and the government imposes a tax on wages of t percent. How will a "rational" individual react—work more, work less, or not change at all? It is interesting to note that in public debate, arguments for all three possibilities have been made with great assurance. In fact, however, the impact of a wage tax upon hours of work *cannot* be known *a priori*.

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[2] A detailed algebraic interpretation of the material in this section can be found in Abbott and Ashenfelter [1976].

[3] "Nonmarket activity" might be a more appropriate term than "leisure," because it includes housework as well as relaxation. We will follow convention, however, and use the less combersome traditional term.

To see this, first observe that the wage tax lowers the effective price of leisure. Prior to the tax, consumption of an hour of leisure cost the individual w dollars; now it costs only (1−t)w dollars. Since leisure has become "cheaper," there will be a tendency to consume more of it, i.e., to work less. This is called the "substitution effect."

Another effect occurs simultaneously when the tax is imposed. Assume that a certain number of hours will be worked by the individual regardless of all feasible changes in the net wage. After the wage tax, the individual receives only $w(1−t) for each of these hours, while before he was receiving $w. In a real sense, the individual has suffered a loss of income. To the extent that leisure is a "normal good," i.e., its consumption varies directly with income, this income loss leads to less consumption of leisure. Because the individual has become "poorer" due to the wage tax, there is a tendency to work more. This is sometimes called the "income effect."

Thus, the substitution effect and the income effect work in opposite directions, so that the impact of a wage tax cannot be determined by theorizing alone. To develop more intuition for this result, consider the following two statements:

(*a*) "With this high income tax, it's really not worth it for me to work as much as I used to."

(*b*) "With this high income tax, I have to work more to maintain my standard of living." Loosely speaking for the person making statement (*a*) the substitution effect is dominating, while in statement (*b*) the income effect is dominating. Both statements can reflect perfectly rational behavior for the individuals involved.

The importance of the indeterminacy generated by the conflict of income and substitution effects is hard to overemphasize. It indicates that only careful empirical work can answer the question of how labor force behavior in future years will be affected by the possible changes in the tax system. Even intense armchair speculation on this matter must be regarded with considerable scepticism.

B. The Work Decision in a Family Context

In the model just described, the individual acts in isolation. However, it often makes more sense to assume that the individual's labor supply decision is influenced by that of his or her spouse.[4] In recent decades, an important development in economics has been the extension of the basic model to take family interactions explicitly into account. (See, e.g., [Ashenfelter and Heckman, 1974].)

To generalize the simple model, imagine that the family has a utility function with three "commodities," husband's leisure, wife's leisure, and family income.[5] As before, the price of the husband's (wife's) leisure is his (her) potential net wage. The family members decide jointly how much each spouse will work,[6] and thus how much income the family unit will have.

When a wage tax is imposed in this model, the story is slightly more complicated than it was before. Each spouse still faces an income effect

[4] Indeed, even the labor supply of one's children might influence work decisions, although this possibility is not explored here.

[5] The question of how the spouses' preferences are aggregated to form the household utility function is discussed by McElroy and Horney [1978].

[6] Of course, it may turn out that one or both spouses will work zero hours in the market.

and substitution effect, but now there are cross effects as well. The fact that one spouse decides, for example, to work less in the market and therefore consume more leisure will tend to effect the behavior of the second spouse, and *vice versa*. Will spouse number two tend to consume more or less leisure when spouse number one works more, other things being the same? Again, the answer cannot be known *a priori*. It depends upon whether the husband's and wife's leisure hours are complements or substitutes. A new source of ambiguity is thus added to a picture that was already somewhat cloudy.

The main result from the simple model therefore continues to hold: the impact of taxation upon hours of work cannot be predicted by theoretical considerations alone.

However, introduction of the family model is important for a reason in addition to reinforcing this basic result. It provides a useful framework for discussing the taxation of the family unit, a subject to be taken up in Sections IV and V below.

C. Problems With the Theoretical Models

The models discussed above, or variations on them, have provided the theoretical framework for practically all economic work on the question of taxes and labor supply. It is therefore of some importance to discuss the major criticisms to which they have been subjected.

For example, the model assumes that an individual is able to choose the number of hours of work that maximize utility, given the net wage. To the extent that the individual faces involuntary (or "Keynesian") unemployment, this assumption is of questionable validity. Moreover, even for an individual who is employed, it is not clear how much freedom there really is to change hours of work.[7]

Although it is doubtless true that individuals do not enjoy the full amount of flexibility assumed in the model, there is more choice in selection of hours of work than might first meet the eye. Moonlighting and overtime, for example, are both opportunities to extend the number of hours worked. Moreover, thinking of the time horizon as a year rather than a day or a week, gives the opportunity to bargain over the length of the vacation period, providing another way to choose number of hours.

Indeed, taking a lifetime perspective with respect to labor supply decisions, the possibilities for even more flexibility become apparent: taxes may influence retirement dates, intensity of effort, or even career choices. We discuss in greater detail such aspects of labor supply in section VI, below. In the meantime, the important point is that if the notion of "time endowment" is suitably interpreted, then the assumption that the individual can make a choice about labor supply seems quite tenable.

Another criticism of the model is that it ignores the nonmonetary aspects of the work decision. After all, job satisfaction, work conditions, and attitudes toward work may be as important as pecuniary considerations. This objection lacks validity, because attitudes toward leisure and income are already built into the utility function. The interesting policy question is always how the tax system changes

[7] See Ham [1977] for a discussion of labor supply when hours of work are "rationed."

labor force behavior given a set of preferences, and the model is designed precisely to help us address that issue.

A more fundamental criticism of the basic model is that it assumes too much "rationality" to be a realistic depiction of human behavior. When a tax is imposed on an individual, does he or she literally perceive that the price of leisure has changed, and then attempt to find a new utility maximizing combination of income and leisure? Many economists would respond that the usefulness of the model is independent of the answer to this question. The model is useful if it helps in understanding and predicting behavioral responses to taxes, and it is irrelevant whether people consciously tradeoff the costs and benefits of additional hours of work. Individuals need only act as if they are maximizing their utility functions. Ultimately, then, the value of the basic model turns upon its usefulness as a framework for empirical analysis, a subject to which we now turn.

III. Taxes and Hours of Work: Empirical Studies

The important conclusion of the theoretical analysis of labor supply is that the impact upon hours of work of a change in tax rates cannot be known *a priori*. A considerable amount of effort has therefore been devoted to empirical investigation of this matter. In this section, we critically discuss two different strategies for such investigation: Personal interviews and econometric studies. This is followed by estimates of how hours of work might change under some alternative tax regimes.

A. Interview Studies

Perhaps the most straightforward way to find out whether taxes influence hours of work is simply to ask people whether they do. Many studies have used personal interviews for this purpose. The most frequently cited of these is Break's [1957] survey of a group of British solicitors and accountants who were either partners or in business on their own.[8] Some of Break's questions dealt with how the individuals determined their hours of work, whether they were aware of the marginal tax rates they faced, and if these marginal tax rates created any incentives or disincentives to work. Break's analysis of the responses suggested to him that ". . . disincentives, like the weather, are much talked about, but relatively few people do anything about them." (p. 549) From this he drew the policy implication that ". . . in the United States, at least, income tax rates could be raised considerably . . . without lowering unduly the aggregate supply of labor." (p. 549)

The study of Barlow, Brazer, and Morgan [1966] tells much the same story. In their sample of affluent Americans, "Only one-eighth . . . said that they have actually curtailed their work effort because of the progressive income tax . . . Those facing the highest marginal tax rates reported work disincentives only a little more frequently than did those facing the lower rates."(p. 3).

Our discussion so far has dealt with the impact of taxes on labor supply in general. When we turn attention to married women, whose labor force behavior has changed so dramatically in recent years, the

[8] A number of other such attempts are discussed in Organization for Economic Cooperation and Development [1975].

survey results yield the same basic conclusions. Barlow *et. al.* observe that "Very few [men] reported that their wives' participation in the labor force. . . was affected by taxes." (p. 3) When asked why a wife who had once been in the labor force was no longer working, ". . . there were virtually no references to tax disincentives. . ." (p. 148) Although it was noted that at the highest incomes women tended to work less, no part of this phenomenon was attributed to high marginal tax rates. Rather, the responses indicated that these wives ". . . felt more free to occupy themselves with voluntary unpaid activities." (p. 149)

The survey results appear to have been quite influential. For example, in Pechman's important book, Federal Tax Policy, one is left with the impression that "The evidence suggests that income taxation does not reduce the amount of labor supplied by workers and managers." (p. 63) Similarly, Lipsey and Steiner's [1972] widely used text states that "Such meager evidence as exists . . . goes against the commonly held view that a lowering of the existing levels of taxes would greatly increase the supply of effort in our economy." (p. 338)

Perhaps, though, some caution must be exercised in the interpretation of survey results. Just because an individual cannot recite his marginal tax rate does not mean that he is unaware of the discrepancy between his gross and take-home pay. And the fact that individuals fail to admit that taxes (or for that matter, other economic variables) enter their work decisions does not mean that it is necessarily true.

B. Econometric Studies

Econometric analysis is a method for studying the impact of taxation upon hours of work which does not rely upon asking people their opinions. Rather, the effect of taxation (or lack thereof) on hours of work is inferred from statistical analysis of data on taxes, wages and labor supply.

In order to be more specific, it is useful to think back to the simple theoretical model presented in section II. The model suggested that hours of work will depend upon the net wage, nonlabor income, and other factors that might influence "tastes" for income versus leisure. (Marital status, sex, age, and number of children are variables that come readily to mind.) In an econometric analysis, at the outset the investigator must choose a definite algebraic functional form to represent the dependence of hours of work upon these explanatory variables. For example, if the function is linear, then the relation will look like:

(3) $H=\alpha_0+\alpha_1 w+\alpha_2 A+\alpha_3 X_1+\alpha_4 X_2+\epsilon$, where H=hours of work, w=net wage, A=nonlabor income, X_1 and X_2 are some relevant demographic and personal characteristics, and ϵ is a random error. The α's are called the parameters of the equation, and show how a change in a given right hand side variable affects hours of work. For example, if $\alpha_1=0$, the net wage has no impact on hours of work, if α_1 is greater than 0, the supply curve slopes upward, and if α_1 is less than 0, it is "backward bending." The presence of ϵ reflects the fact that there are influences on labor supply that are unobservable to the investigator.

The econometrician next obtains data [9] on the values of H, w, A, X_1, and X_2 for groups of households, and uses them to estimate the α's. The most popular estimation technique in these cases is called "multiple regression analysis." With estimates of the α's in hand, inferences can then be made about the changes in H induced by changes in the net wage.

Labor economists have been estimating equations like (3) for many years. Interestingly, in a number of studies, investigators virtually ignored taxes; [10] i.e., they used the gross wage for w, even though theory indicates that the net wage is appropriate. In recent years, however, a number of studies has dealt carefully with the incorporation of taxes into labor supply equations. (See, for example, Hall [1973], Rosen [1976], Burtless and Hausman [1978], and Johnson and Pencavel [1978].)

Since the various studies have used different samples, time periods, and statistical techniques, there are considerable differences in the estimates of the parameters of the labor supply function. However, two important "stylized facts" have emerged:

(*a*) For prime age males, the impact of changes in the net wage upon hours of work tends to be small, and statistically insignificant. This result has emerged from both cross-sectional studies (see, e.g., Cain and Watts [1973]) and from time-series studies [11] (see, e.g., Abbott and Ashenfelter [1976] or Rosen and Quandt [1978]).

(*b*) The hours of work and labor force participation decisions of married women are quite sensitive to tax induced changes in the net wage. Although estimates differ widely, many investigators would agree that if tax reductions led to a 10 percent increase in the net wage, married women would increase their hours of work by more than 10 percent.[12] (See Cain and Watts [1973]).

Before turning to the implications of these results for the labor supply effects of several tax reform changes, more needs to be said about why econometric investigators sometimes give different answers to the question of how taxes affect work decisions. In the process we will point out some problems with econometric analysis as a methodological strategy.

Studies differ in their conclusions for several reasons:

(*a*) Investigators use different samples drawn from different time periods. To the extent that the parameters of the labor supply function changes across these samples and over time, it will lead to different parameter estimates.

(*b*) Different functional forms are used in various studies. The linear specification of equation (3) is the simplest one, but it is certainly not the only possibility. For example, one might believe that hours of work vary with the square of the wage, and therefore augment the equation with the variable w^2. The basic theory gives little guidance as to what the "correct" functional form is, and so investigators must choose specifications largely on the bases of intuition or convenience.

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[9] For example, the Current Population Survey of the U.S. Bureau of the Census has information on such variables for thousands of families.

[10] See, for example, Cain [1967] or Bowen and Finegan [1967].

[11] The time series data are dominated by the behavior of prime age males.

[12] Given the magnitude of current unemployment rates, one might ask if women seeking more work would be able to find it. A discussion of the nature of modern unemployment is beyond the scope of this paper. It seems likely, however, that with appropriate policies, additional workers could be absorbed by the economy. See Feldstein [1972].

(*c*) Investigators use different statistical techniques. The question of how to extract from the data information about the α's is a complicated one, and the relative merits of the various methods are not always clear. Formidable statistical problems arise, for example, because the potential wage for individuals who do not work is unobserved. Different methods of dealing with such statistical issues lead to different parameter estimates. (See, for example, Da Vanzo, De Tray and Greenberg [1976].)

(*d*) Different demographic and personal variables are included in the equations. It is not always clear how many X's to put in equation (3), and what they should be. Consider, for example, years of education. Some would argue that education affects tastes for work and income, and therefore should be included as an independent variable. Others would argue that education only affects work decisions to the extent that it changes the wage, and therefore should *not* be included. In general, the inclusion of an additional X variable will change the estimate of α_1, and therefore yield different implications about labor supply responsiveness.[13]

Regression analysis, then, is not a perfect methodology. But in the absence of controlled experiments,[14] it is the best one available. If interpreted with caution, econometric studies provide results that can be employed to make useful predictions concerning the impact upon work effort of changes in taxes.

C. Tax Reforms and Changes in Hours of Work

As of this date, no definitive empirical study of the impact of taxes on hours of work exists. Such a study would require estimating parameters of labor supply functions for different groups in the population, and using the estimates to simulate the behavior of a representative sample of individuals under alternative tax regimes. What has impeded work in this direction is not a dearth of estimates labor supply elasticities: as suggested earlier, such estimates abound. However, reliable cross-sectional data with information on both family labor supply behavior and tax situation have until recently not been available.[15] Investigators have therefore been forced to estimate tax liabilities by using the tax statutes and making careful guesses about families' deductions, exemptions. Although this has been done with some ingenuity, (see, e.g., Feldstein and Clotfelter [1976]), the results must nevertheless be viewed as rough approximations.

We report in this section some simulation results from a study completed by the author several years ago [Rosen, 1976]. In this analysis, the labor supply behavior of a subsample of U.S. families was simulated under a number of alternative tax regimes. The subsample consisted of married couples in which the wife was between 30 and 44 years of age. This group was chosen chiefly due to expediency: excellent data on their economic behavior (although not on their tax rates) were available in the National Longitudinal Sample for Mature Women 1967,

[13] More precisely, the inclusion of a variable X_k in the equation will influence the estimate of α^0 if w and X_k are correlated.

[14] There have, of course, been controlled experiments concerning *negative* income tax plans. See, for example, Burtless and Hausman [1978].

[15] At the National Bureau of Economic Research, a current project involves analysis of a data set which matches data from Federal tax returns with some information from the Current Population Survey.

and their labor supply response to changes in taxes had already been studied in some detail. Although the labor supply parameters were estimated using 1967 data, the elasticities obtained were quite similar to those that have been found in more recent samples, suggesting that similar results would emerge were the analysis to be done with more up-to-date data.

In the simulations, it was assumed that the hours of work of the husbands were insensitive to changes in the wage, an assumption in conformity with the stylized facts described in section III.B, above. For each wife, it was assumed: (*a*) that the labor supply elasticity, evaluated at the means, was about 2.2; and (*b*) that the wife made her decision to work conditional on her husband's labor supply.[16] In addition, it was assumed in each simulation that marginal tax rates were adjusted proportionately so as to keep tax revenues at the same level as existed during the *status quo*.

The most important simulation concerned the impact upon hours of work of a change in the rules concerning how the incomes of family members are treated for tax purposes. Under the U.S. tax system, husbands and wives are induced to pool their incomes for tax purposes, i.e., to file joint returns. However, for reasons to be explained in the next section, joint filing has been subject to severe criticism. The simulations reported in table 3.1 indicate how labor supply and hours of work might change if spouses filed as individuals rather than jointly. The columns show changes in family net income and in the wives' hours of work. All changes are broken down into categories according to gross family income before the wife works.

TABLE 3.1.—MOVEMENT TO INDIVIDUAL FILING

Gross other family income	Average change in net income	Average change in yearly hours of work
0 to $500	−5.67	0.416
$500 to $1,500	15.80	28.58
$1,500 to $3,000	−23.09	21.97
$3,000 to $5,000	10.21	20.92
$5,000 to $10,000	71.39	28.27
$10,000 to $20,000	210.20	53.29
Over $20,000	381.94	92.42

It appears that the high income families benefit most from this change. Since the wives of high income husbands faced the highest marginal tax rates under joint filing, under individual filing they have the largest inducement to increase work effort. As a consequence, the average net income of the richest families increases more than that of families at lower levels. The simulation, then, although based upon slightly crude assumptions, brings to light an important fact: changes in behavior induced by modifications of the tax system may lead to unanticipated changes in the distribution of money income. It is important to note, however, that the change in welfare may differ from the change in income: wives who work more under the new regime have higher incomes, but earn them only at the sacrifice of some leisure.

[16] An implication of the second assumption is that for purposes of labor supply behavior, the husband's net income is equivalent to family capital income.

A second simulation concerned the impact of child care allowances on hours of work. More specifically, it was assumed that when the wife worked 800 hours per year or more, the family could deduct $400 if there were preschool children, and $160 if there were school age children but no preschool children.[17]

The results of introducting the child-care allowance are in table 3.2, the format of which is identical to that of table 3.1. The negligible change in hours per year induced by the child-care allowance is at first glance somewhat surprising. Although some of the working wives face lower marginal tax rates due to the exemption, their childless sisters face relatively higher marginal tax rates in order to make up for the revenue loss. Taken together, the positive and negative impacts on hours of work and net family income just about cancel each other.

TABLE 3.2.—INTRODUCTION OF A CHILD CARE DEDUCTION

Gross other family income	Average change in net income	Average change in yearly hours of work
0 to $500	6.01	0.53
$500 to $1,500	5.58	−.66
$1.500 to $3,000	5.02	−.79
$3,000 to $5,000	7.57	.12
$5,000 to $10,000	.66	−1.33
$10,000 to $20,000	−15.28	−1.36
Over $20,000	−46.17	−1.28

For the reasons discussed above, the particular quantitative results of this section must be taken *cum qrano salis*. I think, however, that even these crude predictions provide some useful qualitative insights. The first one, already alluded to, is that the substantial labor supply responsiveness of married women to changes in the net wage will have an important impact on the longrun implications of any tax changes. Secondly, the possible countervailing effects on labor supply of measures to keep tax revenues constant must be taken into account.

IV. Taxation of the Family: Background

As noted above, the labor force participation rate of married women has increased dramatically over time. With this increase have come changes in the role of the wife in the family. Given these changes in the economic organization of the family, it is reasonable to ask if the Federal tax treatment of the family is still appropriate. In this section, we provide some historical and institutional background on the tax treatment of the family.[18] This is followed by a discussion in Section V of the implications of this system for labor supply and economic efficiency.

To begin our discussion, it is useful to consider the following three propositions:

(*a*) The income tax should be progressive, i.e., the proportion of income taken by the tax collector should increase as income increases.

[17] These are amounts suggested by the Carter Commission in its study of the Canadian tax system. (See Royal Commission on Taxation [1965, p. 194].)

[18] Some of the material in this section draws upon Rosen [1977].

(*b*) Families with equal incomes should, other things being the same, pay equal taxes.

(*c*) An individual's tax burden should not change when he/she marries.

Although a certain amount of controversy surrounds these propositions (particularly the first), it is fair to say that they reflect a broad consensus as to desirable features of a tax system. Perhaps (*c*) requires some modification. It can be argued that two married persons with a given income have more "ability to pay" than if they were single. This is due to the economies of living together. (Even if two cannot live as cheaply as one, they may be able to live as cheaply as 1.5.) It is not clear if such economies should be considered by tax policymakers.[19] We merely observe that if one adheres to this view, (*c*) should read "The only change in an individual's tax burden when he/she marries should be that which corrects for economies of living together." This modification does not change the basic argument that will be made below.

Despite the appeal of these principles, an unfortunate problem arises when it comes to their implementation. In general, any tax system must violate at least one of them. This point is easiest made by means of an arithmetic example. Assume the following simple progressive tax schedule: a taxable unit pays, in tax, 10 percent of all income up to $5,000 and 50 percent of all income in excess of $5,000. In the first two columns of table 4.1 are shown the incomes and tax liabilities of four individuals, A, B, C, and D. (For example, B's tax liability is $.10\times\$5{,}000+.50\times\$24{,}000=\$12{,}500$.) Now assume that romances develop—A marries B, and C marries D. In the absence of joint filing, the tax liability of each individual is unchanged. However, two families with the same income ($30,000) will be paying different amounts of tax. (The A-B's pay $12,600, while the C-D's pay only $11,000.) Suppose instead that the law views the family as the taxable unit, so that the tax schedule applies to joint income. In this case the two families pay equal amounts of tax, but now tax burdens have been changed by marriage. Of course, the actual change in the tax burden depends upon the difference between the tax schedules applied to individual and joint returns. In our example, we have assumed for simplicity that the schedule remains unchanged. The example does make the main point: given progressivity, we cannot have both (*b*) and (*c*).

TABLE 4.1.—TAX LIABILITIES UNDER A HYPOTHETICAL TAX SYSTEM

	Individual income	Individual Tax	Joint income	Joint tax
A	$1,000	$100		
B	29,000	12,500		
			$30,000	$13,000
C	15,000	5,500		
D	15,000	5,500		
			30,000	13,000

What choice has the U.S. made? Over time, it has changed.[20] Prior to 1948, the taxable unit was the individual, and principle (*b*) was

[19] Nonmarrieds generally have the opportunity to join together with others to enjoy the economies of living together. If they do not, it simply shows that the benefits of living alone more than compensate for such economies.

[20] Much of the following description of the tax law is based upon U.S. Treasury [1975].

violated. In 1948, income splitting was introduced, inducing married couples to file jointly. Family income became the tax base, but it was possible for an individual's tax liability to fall drastically when he/she married—a violation of principle (*c*). The introduction of income splitting was due in large part to the fact that community property states already allowed effective income splitting, giving their citizens a distinct tax advantage. Clearly, the family is the only fair taxable unit under such circumstances. Thus, any discussion of the elimination of joint filing must be made in light of the possibility of legislative action requiring the income of community property couples to be reported on a separate return by the person earning the income or owning the income-producing property.

The differential between a single person's tax liability and that of a married couple with the same income was so large that Congress created a new schedule for unmarried people in the 1969 Tax Reform Act. Under this schedule, a single person's tax liability can never be more than 20 percent higher than the tax liability of a married couple with the same taxable income. (Under the old regime, differentials of up to 40 percent were possible.[21]

Unfortunately, this decrease in the single-married differential was purchased at the price of a violation of principle (*c*) in the opposite direction: in many cases it is now possible for persons' tax liabilities to increase when they marry (i.e., when they file a joint return instead of a single return).[22] Consider, for example, two unmarried individuals with taxable incomes of $20,000. According to the tax schedule for 1978, each pays $3,999 in income tax, or $7,998 together. If they should marry, their family tax liability becomes $9,856. Thus, marriage increases their annual tax bill by $1,858.

It might be asked, then, why married persons continue to file jointly when they have the option to file separately. Married persons may indeed file "separate returns," but they are treated differently from the "single returns" filed by the unmarried. These separate returns have own rate schedule which is designed to prevent the possibility of making a gain by changing filing status.

There are many other interesting aspects of the tax law for families such as special schedules for non-married heads of households, and deductions for dependents. But with sufficient institutional background to explore the economic implications of joint filing.

V. Taxation of The Family: Equity and Efficiency Considerations

To review briefly, under the current regime couples with the same income, other things being the same, pay equal amounts of tax. However, tax burdens may increase substantially with marriage. In addition, the taw law encourages the pooling of husbands' and wives' income into one return—joint filing—because in general this minimizes the family's tax liability. The economist surveying this scene is

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[21] Tax liabilities between singles and marrieds can also differ because of the way certain deductions are computed. See the excellent discussion by Brazer [1978].

[22] The effect of marriage on tax liability depends upon, among other things, how close the spouses' incomes are to each other. The tendency is, the closer the spouses' incomes, the more they lose when they marry. Thus, it is no surprise that couples with two full-time earners complain so bitterly about the current tax regime.

likely to ask the usual two questions—is it equitable and is it efficient? This section discusses these questions.

A. Equity Issues

The current debate on the tax treatment of the family has focused mainly on the equity issue, is it fairer to tax individuals or families? One argument favoring the family as the choice is that it allows a fairer treatment of nonlabor income (dividends, interest, profits). There are fears that, under individual filing, high earnings spouses would transfer property to their mates in order to lower family tax bills ("bedchamber transfers of property"). It is difficult to predict whether this would occur on a massive scale. The view implicit in these fears is that property rights within families are irrelevant. My guess is that such rights *do* matter in many cases, although there is not much strong evidence one way or another. To the extent such transfers would take place, the result would be a lower rate of taxation on capital income. It is beyond the scope of this paper to discuss whether this would be desirable.[23] We merely note that the effect of individual filing on the progressivity of the tax schedule cannot be determined *a priori*. It depends on how tax rates are changed to adjust for revenue differences.

On a more philosophical plane, one of the most cogent arguments for the family as the appropriate unit of taxation is found in the well-known report of the Carter Commission, a group that evaluated the Canadian tax system in the mid-1960's: "We believe firmly that the family is today, as it has been for many centuries, the basic economic unit in society." (Royal Commission on Taxation [1967], p. 123.) "Taxation of the individual in . . . disregard of his inevitably close financial and economic ties with the other members of the basic social unit of which he is ordinarily a member, the family, is in our view [a] striking instance of [a] lack of a comprehensive and rational pattern in . . . [a] tax system." (p. 122)

The case for the family unit is not as compelling as the Carter Commission suggests. Although many believe that sharing is a basic element of the marriage contract which should be taken into account by the tax law, others find no compelling reasons to treat married couples specially. As Bittker argues, "If married couples are taxed on their consolidated income, for example, should the same principle extend to a child who supports an aged parent, two sisters who share an apartment, or a divorced parent who lives with an adolescent child? Should a relationship established by blood or marriage be demanded, to the exclusion, for example, of unmarried persons who live together, homosexual companions, and communes?" (p. 1398)

There is no theoretically correct solution to this question.[24] Although I find the ethical requirements for regarding the individual as the taxable unit to be quite compelling, my purpose here has been less to settle the controversy than to show that there is a case to be made for both views. The hope is that once the presumption that the family should be the taxable unit is removed, then more attention will be

[23] For a discussion of this issue, see Feldstein [1978]. The relation between individual filing and estate and gift taxation would also be worth exploring.

[24] Additional arguments both pro and con the family as the taxable unit can be found in Munnell [1978].

focused upon the efficiency implications of joint versus individual filing.

B. Efficiency Issues

The fact that U.S. tax laws induce married couples to file jointly has been pointed to as a source of discrimination against working wives. In this section we first explain and analyze this contention. The results are then brought to bear on a discussion of the impact of joint filing on the efficiency of the U.S. economy.

When spouses file jointly, they face exactly the same tax rate on their last dollar of earnings. If, for example, the family is in the 30 percent bracket, then both the husband and wife are allowed to take home 70 cents of an additional dollar of earnings. It could be argued, then, that this aspect of the law cannot discriminate against working wives for the simple reason that it does not distinguish between the spouses. However, this reasoning ignores the social reality that in most households, it is assumed that the husband will work full-time, and the wife makes her labor force decision conditional on the husband's income. In effect, then, the first dollar earned by the wife is taxed at the same marginal rate as the last dollar earned by the husband—she bears a higher tax burden on her earnings.

Is it useful to describe this situation as "discrimination against working wives?" Such a characterization may be misleading for two reasons. First, to the extent that any discrimination exists, it is against secondary workers, not wives *per se*.[25] Second, it seems peculiar to label as discrimination an effect which arises because the tax law treats the family as a unit instead of treating spouses asymmetrically. Although it is important to recognize that the current system tends to diminish the net returns to working for married women, it probably only confuses public discussion to label this discrimination against working wives.[26]

Does this higher burden discourage wives from working? In 1977 over 46 percent of all married women participated in the labor force,[27] a substantial number. However, the issue is not whether there are a lot of wives working today, but rather what changes in the labor force participation rates and hours of work would occur under alternative tax regimes.

As noted in section III, an impressive body of econometric literature has addressed this issue. The overall conclusion is that after controlling for the effects of race, number of children, and other personal characteristics, when the net hourly wage increases, on the average there is a substantial increase in hours of work. It follows, then, that since joint filing raises the effective tax rate on the earnings of married women, it probably lowers the amount of time they spend working in the market. We will argue below that this has important consequences for economic efficiency. To do this, however, it is necessary to digress a bit to explain more precisely what is meant by efficiency as economists use the term.

[25] In this context, the word "secondary" does not mean "less important" or "less meaningful." It merely refers to the fact that the attachment to the labor force is not as strong as for some other workers. Clearly, not all working wives are secondary workers: nor are all primary workers necessarily husbands.

[26] A second alleged source of discrimination against working wives is that the law does not permit them to deduct various work related expenses when they enter the marketplace. But as Bittker points out, "Everyone who works away from home—not just the working wife—must get to the job site, dress as the job requires, and pay for lunch if it is inconveneint to bring it in a brown bag." (p. 1435)

[27] U.S. Bureau of the Census, "Statistical Abstract of the United States 1978," Washington, D.C., 1978.

It seems natural to measure the "burden" of taxation in terms of the amount of tax paid. If Mr. I spends $100 on commodity X and the tax rate on X is 5 percent, then I's tax burden is $5.00.

This, however, is only part of the story. Consider the following hypothetical situation. Prior to the existence of the tax, Ms. II consumes 100 units of X per year. After the 5 percent tax is imposed she stops consuming X altogether, spending money that was formerly devoted to X on other commodities instead. Clearly, the tax paid by II is zero, since her expenditures on X are zero. Do we want to say, then, that the burden placed on her by the tax is zero? Certainly not—II's welfare is less than it was before the tax was imposed because her post-tax bundle of commodities is less desirable than the pre-tax bundle. (It is less desirable because she could have selected the post-tax bundle initially, but chose not to.)

The same principle applies to the less extreme (and more common) case in which the imposition of a tax leads to a diminution of the quantity of a good consumed, but not all the way to zero. As long as the tax induces a change in the set of commodities consumed, there is a loss in personal welfare which actually exceeds tax payments. Economists refer to the loss of consumer welfare above the amount of tax collected as the "excess burden" of the tax.

The more responsive the demand for a good is with respect to its price, the more excess burden is generated by taxing it. (In the extreme case where the demand for a good is completely unresponsive to changes in its price, no excess burden is generated by taxing it.) A set of taxes is considered to be "efficient" when it raises a given amount of revenue with as small an excess burden as possible. Intuitively, this means that an efficient tax system should raise revenue in a way that distorts decisions minimally.[28]

Roughly speaking, then, a set of taxes will be efficient when relatively high rates of tax are put on goods whose demands are relatively unresponsive to price changes, and vice versa. However, it cannot be overemphasized that efficiency is not the only goal of taxation. Equity considerations are equally important—if an efficient tax system generates an undesirable change in the income distribution, then the efficient set of tax rates must be modified.[29] A good tax system must represent a compromise between efficiency and equity criteria. Unfortunately, efficiency considerations are all too often misunderstood or ignored by policymakers.

What has all this to do with the tax treatment of the family? Recall the theoretical model of section II.B, in which the family is viewed as a unit which consumes three "commodities": "Goods and services," "husband's time spent in nonmarket activity" (leisure plus housework), and "wife's time spent in nonmarket activity." The prices of the latter two "commodities" are simply the net potential wages of the husband and wife respectively—when an individual works in the market one less hour, the price of that time is the wage income foregone. Now, recall that the statistical studies cited above implied that the wife's demand for "time spent in nonmarket activity" is much more sensitive to changes in the net wage than the husband's. There-

[28] In some cases, it may be a goal of public policy to change certain private decisions using the tax system: e.g., to modify the behavior of polluters.

[29] For example, taxing a drug necessary to sustain the lives of individuals with a particular disease would probably be quite efficient. Yet, it would be rejected out of hand as grossly unfair.

fore, to tax the family unit efficiently, the wife's earnings should be subjected to a lower rate than those of the husband.[30] Yet we have shown that, in effect, just the opposite is occurring.[31]

It is hard to imagine Congress implementing separate income tax schedules for primary and secondary workers, with secondary workers facing lower rates. This does not mean, however, that it is impossible to move family taxation in the direction of greater efficiency. One possibility would be to exempt some proportion of the earnings of secondary workers from tax, a proposal which has been discussed by Joseph Pechman of the Brookings Institution. Another option would be to allow a secondary earner to file a separate return, but only for earned income. A third solution is simply to eliminate joint filing. This would not only be efficient, but would move the tax system in the direction of greater "marriage neutrality" than the other alternatives.

In the empirical labor supply study cited in section III above, some estimates of the efficiency gains from abandoning joint filing were also computed. I found that, with individual filing, the same tax revenue could be collected with an approximately 30 percent lower excess burden (Rosen, 1976, p. 115). Of course, as was also stressed above, the outcome is sensitive to statistical techniques employed and choice of sample. Therefore, this particular figure cannot be taken as definitive. Nevertheless, it seems safe to say that the efficiency of the tax system would increase substantially if joint filing were eliminated.

VI. Taxation and Other Dimensions of Labor Supply

Both the theoretical and empirical work described up to this point have focused upon the impact of taxes on hours of work. This is a fairly accurate reflection of the emphasis in the literature on taxation and labor supply. Such an emphasis is easy to understand, because the number of hours of work is an important variable, and one that is relatively straightforward to measure. Nevertheless, the finding that taxes generally have little impact upon hours of work does not necessarily imply that taxes leave labor supply unaffected, because labor supply is a concept more general than number of hours per week or per year. In particular, there are at least three important dimensions of labor supply that may be influenced by taxes:

(*a*) Lifetime hours of work and timing of retirement;
(*b*) Intensity of work effort; and
(*c*) Quality of work effort.

The theoretical and empirical evidence on these important issues is currently rather scanty. In this section we discuss and evaluate such fragmentary evidence as exists, and suggest some avenues for future research.

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[30] This proposition is proved formally by Michael Boskin [1975a]. An entirely efficient tax scheme would involve taxation of time spent in housework and leisure. This is not only politically infeasible, but also requires solving the extraordinarily difficult problem of placing a value on the time of those who do not work in the market.

[31] Another efficiency aspect of the current system is that it changes the "price of marriage." At present there is no statistical evidence that this has had much impact on individual decisions to marry. However, anecdotes about postponed marriage, divorce, or separation for tax reasons are becoming increasingly common. This suggests that if the current tax regime continues, the marriage tax may become an important consideration in the marriage decision. The sums involved certainly are not trivial. Over a period of 30 years, the present value of $1,858 (the sum from the example above) exceeds $28,613 when the interest rate is 5 percent.

A. Time of Retirement

Although taxes may not influence the number of hours worked per year, they may effect the number of years individuals choose to work; i.e., the retirement decision. The basic theory of work choice described in Section II above has been generalized to provide a framework for thinking about retirement decisions. (See, e.g., Boskin, 1977.) In this more general "life-cycle theory," the individual plans his work and consumption decisions for a given year explicitly taking into account his (her) past and expected future decisions. The theory suggests that an individual will choose to work as long as the return to working, the net wage, exceeds the value of leisure. Of course, age, health, the availability of pensions, etc. are expected to influence the net wage and/or the value that individuals impute to their leisure.

As Boskin [1977] has noted, until fairly recently it was widely believed that financial variables had little to do with retirement decisions. The prevailing opinion was that bad health was the overriding reason for retirement. This view was based mainly upon survey studies in which individuals were asked to explain why they retired. It may be the case, however, that poor health is considered a more socially acceptable reason for leaving the work force than a pecuniary one, so it is not clear how much credence should be given to such studies. Considerable doubt is cast on the health explanation by table 6.1, which documents the rapid fall in the labor force participation rates for elderly males in the postwar period. Is it likely that health has deteriorated to such an extent that it has induced a halving in the participation rate of men over 65 years of age?

TABLE 6.1.[1]—LABOR FORCE PARTICIPATION RATES FOR ELDERLY MALES, 1948–74

	Whites		Nonwhites	
	55–64 yr	65 and over	55–64 yr	65 and over
1948	89.6	46.5	88.6	50.3
1949	87.6	46.6	86.0	51.4
1950	87.3	45.8	81.9	45.5
1951	87.4	44.5	84.6	49.5
1952	87.7	42.5	85.7	43.3
1953	87.7	41.3	86.7	41.1
1954	89.2	40.4	83.0	41.2
1955	88.4	39.5	83.1	40.0
1956	88.9	40.0	83.9	39.8
1957	88.0	37.7	82.4	35.9
1958	88.2	35.7	83.3	34.5
1959	87.9	34.3	82.5	33.5
1960	87.2	33.3	82.5	31.2
1961	87.8	31.9	81.6	29.4
1962	86.7	30.6	81.5	27.2
1963	86.6	28.4	82.5	27.6
1964	86.1	27.9	80.6	29.6
1965	85.2	27.9	78.8	27.9
1966	84.9	27.2	81.1	25.6
1967	84.9	27.1	79.3	27.2
1968	84.7	27.3	79.6	26.6
1969	83.9	27.3	77.9	26.1
1970	83.3	26.7	79.2	27.4
1971	82.6	25.6	77.8	24.5
1972	81.2	24.4	73.6	23.6
1973	79.0	22.8	70.7	22.6
1974	78.1	22.5	70.2	21.7

[1] Source: Boskin (1977, p. 5).

In the past few years a large number of econometric studies of the determinants of the retirement decision have appeared.[32] (See, e.g., Boskin [1977], Quinn [1977], Burkhauser [1977], Blinder, *et. al.* [1978].) Almost uniformly, these studies suggest that financial considerations such as the availability of social security and the implicit tax put on wages by the social security system have statistically significant and quantitatively important impacts on the probability of retirement.

Most of these econometric studies have focused on the interaction between pension and social insurance systems on the one hand, and the retirement decision on the other. Nevertheless, in some cases the parameter estimates can be used to shed some light on the question of how the personal income tax influences retirement decisions, other things being the same. This is possible because the equations generally include potential market earnings as an explanatory variable. To the extent that taxes influence potential market earnings (the opportunity cost of retiring), their impact on retirement decisions can be estimated.

TABLE 6.2—BURKHAUSER'S ESTIMATES OF THE PROBABILITY OF ACCEPTING SOCIAL SECURITY RETIRED WORKER BENEFITS AT AGE 62 AS A FUNCTION OF MARKET EARNINGS

	Market earnings—				
	$2,100	$4,200	$6,300	$8,400	$9,700
Probability	56.5	37.5	21.2	10.0	5.7

For example, Burkhauser [1977] analyzed the probability of males accepting social security retired worker benefits at age 62 as a function of marital status, education, potential market earnings, and several other variables.[33] His estimates of how the probability varies with potential market earnings when the other explanatory variables are evaluated at their means are shown in table 6.2. The numbers suggest substantial responsiveness of the probability of retiring to potential market earnings. More specifically, consider an individual with adjusted gross income of $9,700. Assuming that he pays a payroll tax of 6.05 percent and an average income tax rate of 9.0 percent[34] his disposable income would be $8,495. Interpolating from table 6.2, this $1,504 change in net income would induce an increase of about 4 percentage points in the probability of retirement, a substantial difference.

This computation is meant only to be illustrative. Personal income taxes have not yet been integrated with sufficient care into models of the retirement decision to allow more definitive statement. However, given the apparent sensitivity of retirement decisions to other economic parameters, this would seem to be a subject worth further inquiry.

B. Intensity of Effort

In empirical labor supply studies, hours of work are usually measured as the amount of time elapsed at the workplace. Some reflection will indicate, however, that the effective number of hours of work may not equal actual hours because of possible differences in the intensity

[32] The methodology for estimating parameters when the left-hand side variable is a discrete choice (e.g., to retire or not to retire) is somewhat more complicated than that for the econometric problem discussed in section III.B. See Goldberger (1964, pp. 251–255) for a discussion.

[33] Burkhauser's data were from the 1973 Social Security Exact Match File.

[34] This figure is for a married person with no dependents. See Tax Foundation, Inc. [1977, p. 105].

of effort. Eight hours of work from an "eager beaver" are not the same as eight hours from a "goof-off."

Of course, measurement of intensity of effort is a difficult problem, particularly in jobs where salaries are not based on piece rates. However, substantial progress on this measurement problem has recently been made by Stafford and Duncan [1977], who analyze data from the "Time Use Survey" administered by the Survey Research Center of the University of Michigan. These data contain detailed time diaries in which individuals report on several measures of on-the-job time allocation: Time spent in formal or scheduled work breaks; time spent informally socializing or any other type of unscheduled work breaks; and time spent in on-the-job training.

With such information, Stafford and Duncan are able to compute effective number of hours worked per day in addition to hours of work as conventionally measured. In an interesting experiment, they estimate two labor supply equations similar in form to equation (3) above, one using hours of work as conventionally measured, and one with effective hours of work. Stafford and Duncan find that with the conventional measure, the usual results are obtained—for males, there is essentially no response of hours to changes in the wage. However, when effective number of hours is used as a left-hand side variable, a statistically significant response is isolated. Their equation implies that a 10 percent increase in the wage would lead to a 1 percent increase in effective hours of work (p. 44). Since Stafford and Duncan use a gross rather than net wage variable in their equation, their parameter estimates may be biased. However, the tentative conclusion seems to be that changes in remuneration have a greater impact on effective hours of work than had previously been thought.

C. Human Capital Investments

It has been argued that one of the key sources of growth in the United States and other developed countries is human capital, the investments that people make in themselves in terms of education, health, on-the-job training, etc. By increasing the productivity of workers, human capital investments increase the effective size of the labor force. One of the most important developments in economics in the past two decades has been the analysis of human capital decisions. (See, for example, Becker [1964], Mincer [1974] and Blinder and Weiss [1976].) However, the relation of taxes to human capital investment has not received much attention.

Schultz [1961] argued that the United States tax system discriminates against human capital investment:

> Our tax laws everywhere discriminate against human capital. Although the stock of such capital has become large and even though it is obvious that human capital, like other forms of reproducible capital, depreciates, becomes obsolete, and entails maintenance, our tax laws are all but blind on these matters. (p. 13)

This view has recently been challenged by Boskin [1975b], who argues that Schultz's argument regarding the lack of deductibility for expenditures on human capital investment is misleading once it is recognized that the most important costs of human capital are not items like tuition payments. Rather, the bulk of many human capital investment costs consists of foregone earnings—the wages the individ-

ual does not earn because he/she is in school or involved in an on-the-job training program. It has been suggested that foregone earnings amount to over half the costs of human capital (Boskin [1975b, p. 5]).

Boskin shows that under the assumption that all the costs of human capital investment are foregone earnings, then in a simple model, a proportional wage tax has *no* impact whatsoever on the decision to invest in human capital. The logic of his argument is quite simple. Suppose that the costs of the human capital investment (i.e., the foregone earnings) are C, and the benefits of the investment (i.e., increased earnings in the future) are B. (Both B and C are measured in present value terms.) Then in the absence of taxation, the individual will invest in human capital if benefits are greater than costs; i.e., if

$$B-C>0 \tag{4}$$

Now, suppose a proportional tax on wages at a rate of t percent is levied. Then the net benefits to the individual are reduced to $(1-t)B$. But the costs of the investment are reduced in the same proportion. This is because the foregone wages would also have been taxed at rate t, so the individual gives up only $(1-t)C$ by making the human capital investment. Thus, after the tax is imposed, investment in human capital will take place only if

$$(1-t)B-(1-t)C>0$$

or

$$(1-t)(B-C)>0 \tag{5}$$

Clearly, equation (5) will be satisfied if and only if equation (4) is satisfied, proving that the tax is *neutral*—if it was worth doing the investment before the tax was imposed, it is worth doing after.

However, Eaton and Rosen [1979] have shown that even if one accepts Boskin's assumption that the only costs of human capital accumulation are foregone earnings, the neutrality result does not necessarily follow. There are two reasons for this. First of all, an important assumption in the Boskin model is that the supply of hours of work is fixed regardless of the net wage. Now, hours of work can be thought of as the "utilization rate" of human capital—the more the individual works, the higher is the rate of utilization, and, therefore the higher the return on the human capital investment. In terms of equation (4), to the extent that hours of work change after a tax is imposed, B may change without an offsetting movement in C. In this case, the tax will not be neutral with respect to the human capital decision.

Moreover, in light of the results cited in sections II.A and II.B above, it cannot be said, *a priori*, in which direction imposition of the tax will change B. If hours of work increase with the net wage, then the tax will tend to increase the human capital utilization rate, and increase the amount of investment. But if hours of work are negatively related to the net wage, then the opposite tendency will operate.

A second factor ignored in Boskin's model is the uncertainty of returns to human capital. When an individual makes an educational investment, he or she does not know for certain that it will increase

his or her earnings capacity, or by how much. To forecast the future strength of the markets for various skills is difficult, to say the least. And, it is unlikely that the individual can insure himself against such risk because problems of moral hazard associated with insurance in general are especially pervasive in the insurance of human capital. The private insurer, unable to distinguish clearly between external events and events subject to the control of the insured party, would provide an incentive for an insured worker to work less hard, spend less time seeking a higher paying job, or otherwise earn an income below potential. In such a situation the market is unlikely to provide insurance.

It can be shown that even when hours of work are independent of the net wage, if the returns to human capital are uncertain, then proportional wage taxation will not in general be neutral in the human capital decision. [Eaton and Rosen, 1979]. Rather, in the uncertainty model the impact of taxation is ambiguous because of two conflicting effects:

(*a*) A proportional wage tax cuts the riskiness of human capital because in a sense the treasury serves as the taxpayer's silent partner. If one "wins" in the labor market by receiving a high return from human capital investment, the treasury collects t percent of the winnings. On the other hand, if one loses, the treasury bears t percent of the loss. To the extent that the individual is risk averse, this insurance effect tends to increase human capital accumulation.

(*b*) On the other hand, the proportional tax reduces the individual's wealth. To the extent that the desire to invest in relatively risky assets decreases with wealth, then this wealth effect will tend to decrease investment in human capital.

Thus, the insurance effect and the wealth effect work in opposite directions, so in the absence of specific assumptions on how risk aversion varies with wealth, it is impossible to know a *priori* how a proportional wage tax will change human capital accumulation. We are in a position similar to that described at the end of Section II on the theory of the leisure-income choice: only empirical work can settle the question. However, econometric analysis here is much harder than in the hours of work case because of measurement problems. How does one measure the amount of capital embodied in a human being? What proportion of educational expenditures are consumption, and what proportion investment? How can the amount of earnings foregone in on-the-job training and vocational training programs be estimated?

In light of these formidable problems, it is no wonder that little empirical work has been done on this problem. However, a recent paper by Rosen and Willis [1978] permits us at least to speculate on the impact of income taxes on an important kind of human capital investment, the decision to attend college.

The purpose of the Rosen and Willis (R-W) study is to determine which factors influence individuals' decision to attend college. They investigate a number of "family background" variables, such as religion, achievement test scores, and occupation of father. In addition, they find that the probability is significantly affected by the expected growth rate of earnings after college, and by the ratio of the initial earnings obtained by college graduates to the earnings of those who did not attend college. The higher the growth rate of earnings for the

individuals if he attends college, the more likely he is to matriculate.[35] The effect of the growth rate is both large in magnitude and statistically significant. Since a progressive tax decreases the rate of growth of net earnings associated with any given gross earnings stream, the R-W results suggest that such a tax will substantially decrease the probability of college going. Thus, to the extent that individuals perceive that taxes cut the returns to college going, the amount of this important kind of human capital will be lessened.

This statement must be regarded as only suggestive since the income variables used to estimate the R-W model were gross rather than net of taxes. Moreover, the sample used was not representative of the entire population.[36] The results, however, do suggest that enough of an effect may be present to make further empirical investigation of this problem worthwhile.

VII. Concluding Remarks

In this essay we have reviewed the literature on taxation and labor supply. Most of the theoretical and empirical work has concerned the effect of taxes on hours of work. It appears that taxes have had little effect on the hours of work of primary earners. However, taxes have exercised a substantial disincentive effect upon secondary workers, a group of growing importance in the U.S. economy. The implications of these facts for the optimal tax treatment of the family unit were discussed in some depth.

The econometric results on the effect of taxes on yearly hours of work, as important as they may be, are not the whole story. We also discussed the impact of taxes on some other dimensions of labor supply: Time of retirement, intensity of effort and human capital investment. At the present time however, any statements regarding the relationship between taxation and these very important decisions can only be conjectures. Further investigation should be a high priority for students of both public finance and labor economics.

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[35] These conclusions are based upon a "structural probit" model, in which the variables are corrected for selectivity bias. See Rosen and Willis [1978, p. 38].

[36] The sample consisted of 3,611 respondents to the NBER-Thorndike-Hagen survey of 1968–71, and included male World War II veterans who applied for the Army Air Corps. It was chosen because it covers more than 20 years of labor market experience.

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