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OLD AGE INCOME ASSURANCE

A COMPENDIUM OF PAPERS ON PROBLEMS AND POLICY ISSUES IN THE PUBLIC AND PRIVATE PENSION SYSTEM

SUBMITTED TO THE

SUBCOMMITTEE ON FISCAL POLICY

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

Part III: Public Programs

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LETTERS OF TRANSMITTAL

DECEMBER 11, 1967.

To the Members of the Joint Economic Committee:

Transmitted herewith for the use of the members of the Joint Economic Committee and other Members of Congress is part III, "Public Programs," of the compendium of paper entitled "Old Age Income Assurance," prepared for the Subcommittee on Fiscal Policy.

The views expressed in this document do not necessarily represent the views of members of the committee or the committee staff, but are statements of issues and alternatives intended to provide a focus for hearings and debate.

WILLIAM PROXMIRE,
Chairman, Joint Economic Committee.

DECEMBER 8, 1967.

Hon. WILLIAM PROXMIRE,
Chairman, Joint Economic Committee,
Congress of the United States, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is part III, "Public Programs," of the compendium of papers on problems and policy issues in the public and private pension system, entitled "Old Age Income Assurance."

Part III deals specifically with public programs and contains 13 papers contributed by invited specialists.

The subcommittee is indebted to these authors for their excellent contributions, which we believe will add much to a general awareness of the issues in retirement income policy, particularly as these relate to old age and survivors insurance and tax programs. The time and learning devoted to the preparation of these papers should do much to stimulate interest and to assist in policy decisions concerning future programs for old age income assurance.

Dr. Nelson McClung, consultant to the subcommittee, is responsible for the planning and preparation of the compendium, with the editorial assistance of Anne McAfee, and the advice and suggestions of other members of the committee's professional staff.

As the Executive Director's letter indicates, the compendium should not be viewed as an expression of views or conclusions of the committee staff, nor should it be viewed as an expression of views of the subcommittee or individual members.

MARTHA W. GRIFFITHS,
Chairman, Subcommittee on Fiscal Policy.

DECEMBER 17, 1967.

Hon. MARTHA W. GRIFFITHS,
Chairman, Subcommittee on Fiscal Policy,
Joint Economic Committee,
U.S. Congress, Washington, D.C.

DEAR MADAM CHAIRMAN: Transmitted herewith is part III, "Public Programs," of the compendium of papers entitled "Old Age Income Assurance." This study was prepared at your request in order to bring together current thinking on the questions of retirement income programs and thereby contribute to policy decisions by focusing attention on the more promising solutions to the income problems of older people.

The compendium, which is being issued in five parts, confirms the fact that programs to aid older people have grown in number, size, and complexity, and that the coordination of these programs and their combined impact on the income of older people have received very little attention. Clearly, public policy issues exist with respect to coordinating these programs, appraising their effects on the economy, and improving their equity.

Part III, "Public Programs," contains contributions by the authors listed below. The committee is indebted to these contributors who have given generously of their time and expertise to provide the latest available information and competent analytical perspective on this important subject.

Prof. Henry J. Aaron
Dr. George A. Bishop
Dr. John A. Brittain
Prof. Colin D. Campbell
Mrs. Rosemary G. Campbell
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The major work in planning and compiling this compendium was undertaken by Dr. Nelson McClung, consultant to the Subcommittee on Fiscal Policy, with the advice and suggestions of other members of the staff. He was assisted in the editorial work by Anne McAfee. Nothing herein should be interpreted as representing either the opinions of the staff or the members of the committee on any of the matters discussed.

JOHN R. STARK,
Executive Director, Joint Economic Committee.

OLD AGE INCOME ASSURANCE

Part III: Public Programs

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AUTHORS LISTED ALPHABETICALLY

CONSIDERATIONS AFFECTING SOCIAL SECURITY DURING THE 1970'S

BY DEAN E. A. GAUMNITZ*

This summary is prepared upon the assumption that there are many studies, both completed and underway, by the staff of HEW that relate to problems that are likely to need attention during the next decade or two. Many of these studies are known to the author but equally there are many that are unknown, and, hence, it is possible that this summary may make suggestions relating to problems that have already been analyzed in great detail.

1. A persistent and perennial problem that has been much studied but definitely not solved and which has an extreme impact upon retirees is that of inflation. I need not repeat the well-known statistical summary that may be currently updated which demonstrates the erosion of rising price level on the monthly benefits of the elderly. Unfortunately, this type of economic hardship affects those either covered or not covered by social security. It also places a heavy burden on people in all walks of life and at varying ages, but especially those whose incomes are largely determined by formula rather than dependent upon shifts resulting from forces that work in the marketplace. Included in this latter group, in addition to retired people, will be those benefiting by other types of governmental programs, and not gainfully employed, such as the total group of welfare recipients, or in general those receiving public assistance.

The traditional attitude existing in the minds of many who are closely associated with social security types of programs is that problems of inflation are to be analyzed by those with fiscal responsibility, the Federal Reserve, the U.S. Treasury officials, banking groups, and others. The immediate past history and the likely changes that are related to the serious economic disturbances that will be with us for the next few years, as a minimum, make it mandatory for those concerned with retirement benefits to give relatively more attention to methods of controlling inflation instead of restricting their efforts to techniques of contending with its effects through alterations in the benefit structure.

A united front involving recommendations from many economic groups would be likely to come closer to designing an effective program to combat inflation than one that would result by delegating the responsibility only to monetary and fiscal authorities. People in this latter category need broad general understanding and support if they are to achieve an approach to reasonable stability in the price level consistent with adequate growth.

*Graduate School of Business, University of Wisconsin.

2. A few decades ago, when the social security program was in its infancy, there was a considerable amount of attention given to the similarities and differences between a social and private insurance program. It was pointed out that benefit formulas in relation to payments by the individuals bore a closer individual actuarial proportionality in a private than in the social insurance system. That is, the approximation to actuarial equivalence in a private system not only exists in the aggregate but also on a class-by-class basis in the insurance program. Some people argued that there should be actuarial soundness in the aggregate but the approximation need not be very close among the classes. For example, it was a part of the specific planning in the benefit structure in social insurance that those who had worked a short time to achieve full coverage would, on the average, stand to receive more benefits per dollar of contribution than would be received by a person who was covered for a much longer period. Similarly, a person whose average income was twice that of another would not receive benefits in the same proportion.

The gradual changes that have taken place in social security benefits, contribution rates, and the time of achievement of full coverage, when coupled with retirement benefits earned through private pension plans, may result in net yield of benefits in relation to contributions that would be inconsistent with the criteria established as the foundation. More specifically, a given social insurance program may be based in its benefit structure on a very reasonable set of criteria. Goals may be consistent with modern social philosophy. A similar statement may exist for other types of social programs administered by the Government, such as welfare programs. Private pension plans may also be based on criteria considered reasonable by those who negotiated the agreement. The difficulty may arise, however, when these programs are combined into a conglomerate for the individuals concerned. Progressive versus regressive effects should be analyzed. Studies should, therefore, be made to ascertain whether or not an undesirable disparity exists, and if so, an indicated solution should be forthcoming. Such an analysis must presuppose the existence of criteria to serve as a foundation for evaluating a total system instead of treating social and private pension plans as though only one type existed.

This idea definitely does not contemplate the suggestion that there should be contractual or statutory dependencies existing in one program with respect to another, but, rather, the planning in one sphere should be based on the assumption that other programs are in existence and will continue.

3. The social security program was born in an atmosphere of economic depression and a general lack of confidence in our total social and economic system. Unemployment was widespread and was especially injurious to those in the older age groups. The dole became socially unacceptable, and, therefore, the voting public was ripe for favorable action on a system that would provide retirement income to those who had completed several years of active employment. A benefit structure was designed that would be as high as possible in comparison with rates of contribution which had to supply the funds for the disbursements. Also, benefit payments were to be made as soon as possible with due regard being given to adequacy of the resources in the program.

The originally scheduled changes in contribution rates and benefits have been altered in a more favorable direction on more occasions than were apparently contemplated by those who framed and passed the initial legislation. With three decades of experience and the generation of a much higher level of activity, one would have guessed that charitable types of programs would have been in less need in proportion to the total. It has come as a surprise to many students of the problem that the affluent society has not been associated with decreased pressures for welfare programs at the same time that payments based on a "right" instead of a need have been so sharply increased.

A study should be made to attempt to lay a philosophical foundation for judging the desirable proportionality that should exist between present provision for future existence compared with allocation of resources to solve current problems. It would appear that a constantly rising percentage of social income allocated for preparing for the future should not be carried to an unproductive limit. This is especially serious when social and private systems are combined in their effects, and when private savings of those in higher income groups would be on the rise in spite of graduated income and inheritance taxes. The questions are whether or not there should be a desirable upper limit on the proportion of present income used for provision for the future. What are the philosophical and economic criteria for this judgment? The next question would be the determination of a limit, but presumably with some flexibility.

4. At the time of the peak discussions surrounding the formation of the Social Security Act, the emphasis was on security in the economic sense of the term. Little or no attention was given to a consideration of problems of health, happiness, and social adjustment, except insofar as these problems could be translated into payments, stated in terms of monthly income per retiree.

During the past few years it has become evident that economic security, especially in an affluent society does not lead to social or emotional stability. In fact, some have argued that greater provision for retirement income, beyond a reasonable minimum, provides more time for individuals to become dissatisfied and, therefore, emotionally disturbed about other aspects of security than those of an economic nature. Studies should be made to uncover relationships between economic and noneconomic disturbances in society relating to those segments of our population which stand to benefit from programs of retirement benefits of the material sort.

5. There has been increasing concern given to the mobility of pension rights. Several studies have indicated that mobility of such rights does not seem to be as great a deterrent to job mobility as had earlier been presumed. Greater flexibility in private pension systems, together with the features in the social schemes have, perhaps, tended to decrease restrictions on job shifts. In general, such flexibility should be contributory to the proper allocation of human resources. Studies should be made to ascertain the industries and areas that contribute to immobility of such resources and to throw light on the adverse effects, if immobility is indeed an apparent cause of dissatisfaction. In view of unrest that exists in many segments of society, a study should be designed to determine the casual connection, if any, that exists between

immobility and the difficulty faced by some segments of society in becoming socially adjusted in new surroundings. Unfortunately, it is possible that mobility that permits greater production by a proper allocation of resources is likely also to create social disturbances resulting from such change. If studies were to indicate that such is the case, some light should be thrown on the possible direction of solutions. If irregularity of employment, shifting employment, nonvesting of benefit rights, the failure to make individual provision for retirement, and social dissatisfaction in new surroundings are found in essentially the same groups or classes of people, these groups might be the sources of growth in public assistance programs. This package of difficulties should be studied and tentative solutions determined.

6. Extreme changes in marriage and birth rates associated with the disturbances of World War II are going to yield sharp fluctuations in the numbers and proportions of our population that reach age 65 before this century is over. Such rapid changes, when their impact is felt upon our retirement programs, will affect the funds available for investment and, therefore, the base for growth in our industrial system. When we will enter a period of sharply increased disbursements for retirement purposes, this appears likely to be the time when there will be a substantial increase in those seeking jobs at the beginning of their adult careers. Such disbursements for retirement purposes may decrease the availability of funds for industrial growth and housing. A study should be made to see whether or not this coincidence is likely to occur, and if so, the provision can be made at the present time to alleviate the disturbances likely in the future.

THE OBJECTIVES OF SOCIAL SECURITY

BY JOSEPH A. PECHMAN, HENRY J. AARON, and MICHAEL TAUSSIG*

Social security serves two related but conceptually distinct objectives. The first is to guarantee minimum income support for the aged, the disabled, and dependent survivors. In recent years, the success of the program in achieving this welfare goal has been increasingly judged by the degree to which it keeps beneficiaries out of poverty. The second objective is to help moderate the decline in living standards when the earnings of the family head cease because of retirement, disability, or death. This earnings replacement objective is independent of the goal of preventing poverty; benefits go to families at all income levels. Both objectives of social security must be carefully defined, because acceptance of the current program and proposals for improving it hinge on the public's evaluation of their comparative importance.

The case for a social security program intended to achieve these objectives depends in part on the observed inability of most people to make adequate financial provision for retirement, disability, or premature death. Mainly, however, it depends on what appear to be widely shared humanitarian values: that (*a*) the aged, the disabled, and dependent survivors of deceased family heads should not have to live in destitution, and (*b*) the Government should help to protect individuals against catastrophic losses of income. It is also widely agreed that people should be eligible for benefits without degrading eligibility tests. The purpose of this chapter is to explain the implications of explicit acceptance of these values for broad policy decisions in social security.

Widespread acceptance of the basic objectives explains why social security is a successful institution. On the other hand, disagreement about decisions concerning the proper level and composition of benefits arises largely because social security has an appealing but distorted image based on a misleading analogy to private insurance. This image impedes intelligent consideration of alternative means of shaping the course of the program. In practice—as well as in principal—social security is not a substitute for private insurance, but rather a mechanism for transferring financial resources from the working generation to those who cannot work because of age, disability or dependency status. This is a point that has been emphasized by many economists and is no longer in serious dispute.[1] The key issues revolve

*The authors are, respectively, director of economic studies, the Brookings Institution; associate professor of economics, University of Maryland; and assistant professor of economics, Rutgers University. This paper is part of a forthcoming book on "Issues in Social Security" being prepared for the Brookings Institution.

[1] See, for example, Ida C. Merriam, *Social Security Financing*, Federal Security Agency, Social Security Administration, Division of Research and Statistics, Bureau Report No. 17 (1953), pp. 2, 135; and Paul A. Samuelson, "Social Security," *Newsweek*, Feb. 3, 1967, p. 88.

around methods of establishing criteria for determining the size of the transfer and for distributing and financing benefits.

Rationale for Social Security

In an economy where most economic decisions are freely made, why does society choose to override individual choice between private consumption and saving for the risks covered by social security? For simplification, the following discussion of this question is limited to the problem of providing income during retirement, but the analysis can be generalized to the other risks.

NEED FOR A GOVERNMENT PROGRAM

Each person faces daily a multitude of choices about how to spend his income or wealth—how much to spend on food, clothing, entertainment, and other current wants, and how much to set aside for retirement when earned income declines sharply or ceases. In the absence of compulsory social insurance, each person will make these decisions on the basis of his own tastes. He will invest his savings so as to achieve what he regards as the best mix of yield, liquidity, and safety. In making these decisions, the rational person will balance the cost of saving (foregone consumption today) against the benefits of saving (larger income in retirement) and will set aside the amount he considers appropriate. Each person should be able to achieve an optimum allocation of consumption between his working life and his retirement years—optimum in the sense that no other allocation would make him better off. Any other pattern is, by definition, not better and probably inferior.

In this view of the world, social security must, by assumption, "distort" the allocation of consumption and is, therefore, an unjustified interference with individual choice. Many persons may be forced to "save" more of their income than they would desire. In the extreme case, an individual with no dependents who is certain he cannot survive to retirement age would "prudently" save nothing for his retirement. Yet, social security taxes deprive him of the opportunity to dispose freely of a substantial part of his income. Social security also interferes with the freedom of workers to decide how to invest that portion of their income claimed by social security taxes. If they are skilled investors, they might use these funds to purchase assets with higher yields than the returns which social security implicitly provides. Such individuals would not gain from social security; actually, they may have a lower total income in retirement.[2]

Although attractive to anyone who values individual freedom in making economic decisions, this conception of the role of individual choice in providing for retirement is unrealistic. It does not take account of the fact, which even the most severe critics of social security will generally concede, that voluntary savings cannot yield the poor worker (i.e., the worker whose income is close to the amount necessary for subsistence) an income sufficient for retirement.[3] A family which

[2] The views described here are expressed forcefully by Milton Friedman in *Capitalism and Freedom* (University of Chicago Press, 1962), pp. 187–189.
[3] *Ibid.*, p. 184.

cannot feed and clothe itself adequately from current income cannot be expected to sacrifice present consumption to provide for uncertain consumption needs in retirement.

The problem of poverty does not in itself negate the argument for individual provision for retirement, for there is no reason to presume that poor people are necessarily inferior judges of how best to allocate whatever income they may possess. If some are too poor to purchase adequate amounts of any commodity, including savings, a possible solution is to supplement their incomes through transfer payments. When incomes reach whatever level is deemed socially adequate, each person could then determine the amount of retirement protection he wishes to buy.

This discussion opens up major issues concerning Government policies of income supplementation for all the poor. It is sufficient to note at this point that nobody has yet recommended a system of transfer payments that would provide the poor with a sufficient margin for saving, as well as for current consumption.

Furthermore, even individuals who have sufficient earnings during their working lives may have insufficient savings at retirement, either because they incorrectly gage their retirement needs or because their personal investments turn out badly. Most people would agree that the aged poor should not be left unaided in these circumstances, and that the Government bears the ultimate responsibility of providing income support for such unfortunate people. Because humanitarian values prevail in our society, it may be assumed that the Government will guarantee a minimum subsistence level of income for the aged (and perhaps for other groups as well). The notion that Government should guarantee a minimum level of income support for all the aged has widespread acceptance.[4] Because "subsistence" is a subjective concept, and because the costs of providing income support for the poor are large, the precise level of support to be guaranteed is a controversial issue.

Once society agrees on a minimum income guarantee, however, a further decision is required on the conditions under which the guarantee will be provided. The Government can either provide minimum subsistence payments to each eligible person regardless of his other income, or it can make them available only if his income falls below a stipulated level. The former method—the universal *demogrant*—is followed in Canada and some other foreign countries. The latter method—the welfare approach—is exemplified by the public (including old-age) *assistance* programs in the United States.

Old-age *retirement* benefits in this country are paid on terms which fall somewhere between these extremes, although they are much closer to those of the universal demogrant than to those of welfare. Only persons who have worked long enough to qualify for the required insured status are eligible to receive benefits. Persons who meet this qualification receive payments without consideration of their income and wealth. Only if an insured person earns enough to be disqualified

[4] See, for example, Bert Seidman, "The Case for Higher Social Security Benefits," *AFL–CIO American Federationist*, vol. 74, No. 8 (January 1967), pp. 1–8; and Chamber of Commerce of the United States, *Poverty: The Sick, Disabled, and Aged* (Washington: 1965), pp. 69–73.

by the earnings test is he denied benefits at age 65. Further, retirement benefits are not intended solely to guarantee a subsistence income to beneficiaries.

The welfare method has one great advantage over the universal demogrant: if the proportion of the aged requiring government help is small and if the administrative costs of determining need are not excessive, the objective of preventing destitution is accomplished at minimum expense by limiting payments to those with demonstrated need. Nonetheless, the welfare method has been rejected by most people because of two aspects.

First, a welfare program separates people into two groups—those who support themselves and those who require Government help.[5] The degree to which this distinction is degrading depends in large measure on the method by which eligibility for benefits is ascertained (i.e., the means test). When the test involves detailed probing, and frequently degrading investigations, the number of eligible persons who will even apply for benefits is severely limited; this is evident from the history of public assistance. On the other hand, eligibility for veterans' disability pensions is determined on the basis of a simple income affidavit, subject to sample audit, supplied annually by recipients. Neither a sense of alienation nor reticence to apply for benefits has been noted in this program.

Second, the welfare method may weaken individual incentives to save for retirement needs. Many persons would have a strong incentive to save less for retirement than they would if there were no Government program. They may safely enjoy maximum consumption in their youth, once they know that they can fall back on Government assistance when they retire. In addition, the fact that improvident individuals could finance retirement at public expense may discourage saving by people who otherwise would prefer to provide for their own retirement needs rather than depend on Government support. The importance of these perverse incentive effects depends critically on the implicit "tax rate" used under the guarantee. If benefits are reduced $1 for each $1 of investment income (that is, a 100 percent tax on investment income), the disincentive effects are bound to be far more severe than if benefits are reduced, say, 30 cents for each $1 of investment income (that is, a 30 percent tax on investment income).[6]

The price of rejecting the welfare method of dealing with the aged poor is vastly higher expenditures to attain the same objectives. This price should be explicitly acknowledged as the cost of avoiding the humiliation of the means test and any discouragement of private savings that might occur. The historical development of old-age, survivors, and disability insurance (OASDI) and old-age assistance programs in the United States shows that our society has been willing to pay this cost.

Experience in the past with the means test under public assistance has resulted in an unfortunate emotional tendency in the community

[5] This point is developed fully by Robert M. Ball, "Social Insurance and the Right to Assistance," *Social Service Review*, vol. 21, No. 3 (September 1947), pp. 331–344.

[6] These aspects of social insurance are carefully discussed by Richard A. Musgrave, "The Role of Social Insurance in an Overall Program for Social Welfare," *The American System of Social Insurance, Its Philosophy, Import, and Future Development* (Princeton University, forthcoming).

to reject indiscriminantly *any* eligibility test for OASDI benefits. It should be kept in mind, however, that the benefits to be derived from any device that avoids the problems traditionally associated with the means test, and yet holds down the costs of public assistance, are potentially enormous. The search for such a test, similar perhaps to the test for veterans' disability pensions, continues.

The earnings test, while unpopular, does reduce significantly the cost of OASDI without raising the problems outlined above. First, since only a minority of persons eligible to receive social security benefits engage in full-time employment and thus may be subject to the earnings test, OASDI benefits are paid to the majority of the aged. Thus, the problem of segregating a minority to be singled out as the needy group does not arise. Second, because the earnings test is by design not an income test, it does not take account of the income from accumulated assets and, therefore, does not penalize individual savings.

BENEFITS ABOVE POVERTY LEVELS

The argument thus far supports the establishment of a Government program that guarantees a minimum of income support for the aged. But many of the characteristic features of the social security system go much further. While minimum benefits fall well below the officially defined poverty thresholds, benefits at the upper end of the sale are above subsistence levels and bear some relationship to the individual's lifetime earnings. A number of arguments have been made in support of such a system; in combination they add up to an impressive case.

Shortcomings of individual savings decisions.—The principle that individuals should make the bear responsibility for the decisions that affect their own economic well-being underlies much of the intellectual opposition to an old-age insurance program. Individuals are deemed to be the best judges of their own preferences. That many individuals often make foolish decisions, as recognized after the fact, is not necessarily objectionable; for in learning from their mistakes, they may develop self-reliance and accumulate practical knowledge that will be to their advantage when they make later decisions. The principle of individual responsibility is the basis of the case for free choice about economic matters in general, and there is no strong objection to it in most practical applications.

Decisions about saving for retirement, however, are vastly more difficult than nearly any other economic decision which most people are called upon to make. They depend on subjective appreciation of wants in a much later period—possibly four or five decades. They require an individual to consider his future stream of earnings and other income, and to recognize several possibilities: that he will be married and have a family; that he may be unemployed involuntarily for considerable periods of time; and that he may become disabled or die prematurely. To save intelligently, the individual must also be able to appraise the probable future purchasing power of the income from various assets. Most important of all, the individual may not be aware of his mistakes until he is close to retirement, when the consequences are irremediable.

There is widespread myopia with respect to retirement needs. Empirical evidence shows that most people fail to save enough to pre-

vent catastrophic drops in postretirement income. In 1962, the median amount of investment income of all aged persons was less than $300.[7] Not only do people fail to plan ahead carefully for retirement; even in the later years of their working life, many remain unaware of impending retirement needs.[8] Unfortunately, the mistakes of youth are to a large degree irreversible, since it is generally impossible to accumulate in a short period just before retirement sufficient assets to provide adequate retirement income. In an urban, industrial society, Government intervention in the saving-consumption decision is needed to help implement individual preferences over the life cycle. There is nothing inconsistent in the decision to undertake through the political process a course of action which would not be undertaken individually through the marketplace.[9]

Even if an individual plans ahead and gages accurately his retirement needs, it is questionable that he has sufficient knowledge about other relevant considerations to make the necessary saving consumption decisions. The depression of the 1930's illustrated dramatically the difficulties that even experts encounter in planning their personal investments. The information required for intelligent longrun investment planning is expensive; for small investors, the cost of hiring professional investment counseling (for example, in the form of purchases of shares in a mutual fund) is frequently prohibitive. Deficiencies in Government economic policy that permit depressions and inflations may sweep away the carefully planned saving of even the most provident and skillful investors. The available evidence suggests that the problem of uncertainty may explain why people do not save enough. Apparently, once a private pension plan has provided a minimum base of retirement income, most people are willing to save *more* on their own, rather than less.[10]

A person who is saving for retirement generally faces the investment dilemma of choosing between fixed yield assets that offer little protection against inflation and other instruments that require financial sophistication or carry considerable risk. Time deposits in commercial banks and other institutions fall into the first category. Yields on such deposits offer small returns after allowance for the steady increase in prices that has occurred since the end of World War II. Common stocks fall into the second category; as the *major* form of savings, they are beyond the sophistication of the majority of the population. Even if an experience like the stock market crash of 1929 is

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[7] Lenore A. Epstein and Janet H. Murray, *The Aged Population of the United States: The 1963 Social Security Survey of the Aged* (U.S. Department of Health, Education, and Welfare), Social Security Administration Report No. 19 (1967), table 3.18, p. 302.

[8] According to a field survey taken in 1960, less than half of nonretired persons over 55 years of age were able to estimate the amount of income that they would obtain from their retirement program and from social security. More than two-thirds were unable to estimate their income requirements during retirement. (See James N. Morgan, Martin H. David, Wilbur J. Cohen, and Harvey E. Brazer, *Income and Welfare in the United States* (McGraw-Hill, 1962), p. 442. See also the discussion by Derek C. Bok, "Emerging Issues in Social Legislation: Social Security," *Harvard Law Review,* vol. 80, No. 4 (February 1967), pp. 738–739).

[9] This tendency to make economic decisions politically is reviewed by William J. Baumol, *Welfare Economics and the Theory of the State* (second edition, Harvard University Press, 1965). (See also Stephen A. Marglin, "The Social Rate of Discount and the Optimal Rate of Investment," *Quarterly Journal of Economics,* vol. 77, No. 1 (February 1963), pp. 95–111.)

[10] See Phillip Cagan, *The Effect of Pension Plans on Aggregate Saving: Evidence From a Sample Survey,* National Bureau of Economic Research, Occasional Paper No. 95 (Columbia University Press, 1965); and George Katona, *The Mass Consumption Society* (McGraw-Hill, 1964), ch. 19.

discounted as unlikely to recur, it would be dubious social policy to encourage large-scale investment by individuals in common stocks. Other savings instruments—for example, Government saving bonds, cash, annuities—all suffer from one or the other of these shortcomings as vehicles for large amounts of long-term savings.[11]

Shortcomings of private pension plans.—The shortcomings of private pension plans persist despite substantial incentives given by the income tax and other Federal statutes for the development of adequate plans by industry. A major incentive is the provision that allows an employer to deduct from his taxable income up to 5 percent of his payroll for amounts set aside in a pension plan approved by the Internal Revenue Service. The employee is not required to pay income tax until he receives pension benefits.[12]

Only about one-fifth of the total number of persons aged 65 and older now receive private pension benefits. By 1980, the proportion will be between a third and two-fifths.[13] Moreover, the benefits paid are, on the whole, small, Many plans are not insured, and many are inadequately financed. Vesting is long delayed, so that job mobility is preserved only at the price of surrendering pension credits. Given the limited coverage of private pension plans, the inadequacy of their benefits for many covered workers, and their other shortcomings, they can hardly be expected to provide sufficient earnings protection in old age for more than a minority of the work force for many years to come.[14]

Social costs of inadequate provision for retirement.—As pointed out earlier, it becomes difficult to hold to the principle of individual responsibility when the consequences of individual mistakes are extreme. The case for social intervention becomes overwhelming when it is recognized that one individual's mistakes affect not only his own well-being but also that of his family, friends, and local community. Even those true believers in individual responsibility who could bear with equanimity the suffering of the individual "responsible" for his own fate find it difficult to justify the suffering of other "innocent" persons.

The social costs that result from inadequate provision for retirement are considerable, even if all the aged are guaranteed a subsistence income. Suppose that, in the absence of a social old-age insurance program, an individual with an average income during his working years retired without any personal savings. If he were guaranteed only a minimum subsistence income, the fall in his living standard would impose serious costs on his relatives, friends, and local community. Even under present social security provisions, heavy costs sometimes fall on children or others who have to make it possible for aged persons to maintain living standards close to those which they had enjoyed earlier. To lighten such costs a Government program to provide income maintenance related to previous income standards is needed. To guarantee only a minimum, poverty-line level of income is too severe a policy in a society in which maintenance of status depends so critically on the maintenance of previous levels of income.

[11] For a summary of a recent study of this problem, see H. J. Maidenberg, "Personal Finance: Annuities at Age 65," *New York Times*, June 22, 1967, p. 51, col. 5.

[12] *Internal Revenue Code*, secs. 401–404.

[13] Daniel M. Holland, *Private Pension Funds: Projected Growth*, National Bureau of Economic Research, Occasional Paper No. 97 (Columbia University Press, 1966).

[14] See Robert M. Ball, "Policy Issues in Social Security," *Social Security Bulletin*, vol. 29, No. 6 (June 1966), p. 5.

DETERMINING THE LEVEL OF BENEFITS

The factors discussed thus far lead to the conclusion that the payment of retirement benefits above subsistence levels of income is consistent with valid social objectives. But, to justify the need for some social intervention in providing for retirement is easier than to determine the proper degree of intervention. The ethic of individual responsibility has greater and greater force, the higher an individual's income. The social interest in maintaining very high incomes is correspondingly very weak. To take an extreme example: there is no justification for public provision of retirement benefits based on the full income of a high-level executive whose earnings exceeded $100,000 a year for many years. Some compromise between amounts no greater than those necessary to guarantee subsistence income levels and amounts related to incomes at the upper tail of the distribution is necessary. But, the choice within this wide range is a pragmatic decision, on which analytical considerations are of little help. In reaching a decision, the desirability of making public expenditures for other purposes must be weighed against the desirability of pushing up social security benefits for those with relatively high preretirement incomes. The present modest level of OASDI benefits certainly does not exceed the wide range suggested by this analysis; minimum benefits unfortunately fall short of the levels needed for subsistence.

In practice, OASDI benefits above the minimum are determined on the basis of preretirement earnings. The ratio of benefits to preretirement earnings is called the "replacement rate," because benefits are supposed to replace those earnings. The benefit formula is structured so that replacement rates vary inversely with previous earnings; the higher the preretirement earnings, the lower the replacement rate. Thus, while high earners are entitled to larger absolute benefits, their benefits are less relative to previous earnings than are those of low earners.

This structure is roughly consistent with the two objectives discussed earlier. The high replacement rate for the low earner and the minimum benefit can be interpreted as a guarantee of minimum income support for the aged. The larger absolute benefits paid to the high earner can be viewed as an effort to meet the objective of preventing drastic declines in the incomes of the nonindigent aged. This interpretation of the OASDI benefit structure corresponds roughly to the traditional social security concepts of social adequacy and individual equity.

Image of Social Security

Social security is most commonly viewed as a system of mandatory insurance, different in important respects from private insurance, but nonetheless insurance. This analogy shapes the image of social security and thereby influences the prevailing body of beliefs, conceptions, and opinions that govern popular understanding of the system. It has played a major part in developing public support. Nevertheless, the analogy is strained and, in the end, seriously misleading.

SOURCES OF THE INSURANCE ANALOGY

Use of the insurance analogy to characterize social security in the United States has popular appeal because the nature of individual saving and private insurance is familiar and enjoys considerable respectability and even prestige. The flow of funds between the individual and the ultimate user of these funds is a vital part of a free market economy. Insurance companies are, furthermore, an important intermediary in this process; they channel the savings of many individuals to firms that wish to add to their productive capacity. The rates of return on individual savings reflect in large part the productivity of the physical capital they finance. There is, thus, a connection among the amount an individual saves, the value of his accumulated assets at retirement, the value of the annuity he can purchase with his previous savings, and the creation of additional physical capital and productive capacity in the economy. Provided the economy's resources are fully employed, these relationships are straightforward and are widely understood.

The vocabulary of the social security system helps to promote the insurance analogy. The very names—social insurance, old-age and survivors insurance, and disability insurance—suggest the analogy. Individual contributions (payroll taxes) are formally paid into trust funds. Benefits to retirees, survivors, and the disabled are formally based on preretirement earnings and are paid from the same trust fund accounts. Since interest is credited on trust fund balances, it is tempting to conclude that the trust funds are similar to the reserves of private insurance companies. Finally, statements by social security experts often tend to reinforce the parallel to private insurance. The following excerpt from a recent article by the Commissioner of Social Security is representative of many similar writings:

> The idea [of social security] is simply that while people work and are earning they contribute a part of their earnings to a fund, with contributions from the employer and now, in many countries, also from the Government. When earnings stop because one is too old to work or too disabled to work or because the wage earner in the family dies or because there is no job to be had or there are extra expenses connected with illness, for example, then the accumulated funds from all contributors are used to make up for the loss of income or to meet, in part or in whole, the expenses incurred. In return for setting aside some of the money one has when one is earning, the system provides an assured income when one is not.
>
> Social insurance, like all insurance, averages out among all who are covered the risk that is too much for any one individual to bear.[15]

The following statement by Barbara Wootton expresses a very different view:

> As things are, everybody now recognizes an increasing element of fiction in current income schemes. As Americans have

[15] Robert M. Ball, "Policy Issues in Social Security," *Social Security Bulletin*, vol. 29, No. 6 (June 1966), pp. 3–4.

cause to realize, the coverage of income-maintenance schemes tends almost irresistibly to expand. But, as these schemes become more generalized, their insurance basis becomes more and more illusory; until in cases where, as in Britain, virtually universal coverage has been attained, fiction ousts fact altogether.

At this point, the simple facts of the situation are that benefits on a prescribed scale have been promised, and that funds must be provided to meet them; that is all. In these circumstances, the allocation of precise fractions of contributors' payments to cover particular risks becomes an academic, rather than a genuinely actuarial, exercise. The performance of this exercise in the sacred name of insurance demands, however, elaborate and expensive systems of recording the experience of millions of beneficiaries. These monumental systems are indeed a tribute to the skill and accuracy of the administrators who devise them, and to the ingenuity of the mechanical devices employed in their operation; but, are they really necessary, and have they, indeed, any meaning? Is it, in fact, worth maintaining what has become no more than a facade? [16]

The fact that OASDI benefits are designed to achieve objectives other than individual or group equity is obvious to casual observers as well as to those who are intimately familiar with the system. Social security officials have frequently stressed that social insurance differs from strict insurance principles because of considerations of social adequacy. However, they do not seem to regard such differences as sufficiently basic to require abandonment of the insurance vocabulary. For example, the Chief Actuary of the Social Security Administration has said:

> It is recognized that the use of the term "social insurance" may result in some misunderstanding of the basic nature of a social security program by the general public, who will tend to think of it in terms of their acquaintance and knowledge of private insurance, or even Government insurance involving a contractual relationship (such as the national service life insurance program, crop insurance, and parcel post insurance). Nonetheless, the term "social insurance" is a very popular one both here and abroad, and by usage and dictionary meaning seems proper.[17]

Belief in the insurance nature of the relationship between an individual's OASDI benefits and taxes is the basis of the image of social security. The most important implication of this image is the belief

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[16] "The Impact of Income Security on Individual Freedom," in James E. Russell (ed.), *National Policies for Education, Health, and Social Services* (Doubleday, 1955), pp. 386–387.

[17] Robert J. Myers, *Social Insurance and Allied Government Programs* (Irwin, 1965), p. 8; also see pp. 8–10, where the differences between social insurance and private insurance are carefully discussed.

For the views of a representative of the private insurance industry who expresses concern about the analogy between private insurance and social security, see Roy M. Peterson, "Misconceptions and Missing Preceptions of Our Social Security System (Actuarial Anesthesia)," *Transactions of the Society of Actuaries* (November 1959), pp. 812–851. Peterson has also collected quoted statements by various top public officials which demonstrate the prevalence of the belief in the insurance analogy: "The Coming Din of Inequity," *Journal of the American Medical Association*, vol. 176, No. 1 (April 1961), p. 38.

that each individual pays for his own benefits, and, therefore, that he receives his benefits not as a matter of public charity, but, rather, because the benefits are his earned rights. This view largely explains why being a social security beneficiary carries no stigma. It is also responsible for the belief that benefits cannot legally be withheld from any entitled person.

Another feature of the system—the relationship of both benefits and contributions to an individual's earnings during his working life—seems to imply and be implied by the insurance analogy. Basing benefits on previous earnings is accepted as a simple matter of equity: individuals who pay more into the fund receive higher benefits when they retire just as individuals who choose to pay higher insurance premiums subsequently receive larger annuities from private insurance companies. It seems a fair conclusion that these elements of the private insurance analogy, which are understandable to most citizens, contribute to the tremendous appeal of social security to virtually all classes of society.

SIMPLE ECONOMICS OF SOCIAL SECURITY

Nevertheless, when the terminology of social security is stripped away and the structure of the system is examined, it is clear that the private insurance analogy is largely invalid. Decisions about how retirement benefits should be distributed and how they should be financed are, in principle, independent. In fact, to make benefits depend directly on the amount an individual has paid in taxes would be inconsistent with the objectives of the program.

The Committee on Social Insurance Terminology of the American Risk and Insurance Association has suggested a detailed definition of social insurance which lists many of its characteristics. The committee states explicitly that one major characteristic is that "the benefits for any individual are *not* [emphasis added] usually directly related to contributions made by or in respect of him, but, instead, usually redistribute income so as to favor certain groups such as those with low former wages or a large number of dependents." The committee added that its "definition of social insurance shows that in addition to possessing some characteristics which it shares with voluntary insurance written by private insurers, social insurance possesses many unique characteristics." [18]

In practice, the relationship between individual contributions (that is, payroll taxes) and benefits received is extremely tenuous. Present beneficiaries under OASDI receive far larger benefits than the taxes they paid, or that were paid on their behalf, would entitle them. Furthermore, this situation will continue indefinitely—though to a decreasing extent—as long as Congress maintains benefit levels in line with higher wage levels. This arises because OASDI is not an insurance system, but a transfer payment system that distributes to the aged a share of the gains from the growth in the overall productivity of the economy.

Some participants in private group retirement plans also receive far larger benefits than they are entitled to on the basis of their own

[18] *Bulletin of the Commission on Insurance Terminology of the American Risk and Insurance Association*, vol. 1, No. 2 (May 1965), p. 2.

contributions. This situation is common at the beginning of a system, since full benefits are frequently awarded to workers who have contributed to the retirement plan for only a fraction of their working lives. This practice gives rise to "past service credits," the liability which future beneficiaries (or the employer) must bear. Past service credits are also generated when a mature retirement system is liberalized, to the extent that those near retirement age partake of liberalized benefits without having had to make commensurate contributions.

The similarities between past service credits in group insurance and the aspect of OASDI make equating of the two types of programs tempting. Despite this similarity, the analogy between group insurance and social security is just as tenuous and misleading as the more general analogy between individual insurance and social security. One obvious difference is that failure of a firm to pay premiums for a group insurance plan terminates the insurance for all members of the group, whereas employees covered by OASDI are credited with quarters of coverage even if the firm does not pay the tax due.

The key distinction between the two approaches—private insurance and social security—turns on whether an individual currently in the labor force and paying taxes into the social security trust funds is paying for the benefits of current retired workers and survivors or for his own or his family's future benefits. In individual insurance, each person's premiums are contractually tied to his own and his family's future benefits. No insurance company knows how many new policies it will sell, and, therefore, does not know the amount of its future cash inflow from premiums. Consequently, it must charge its present customers enough to create a reserve fund sufficiently large to meet its future financial obligations.

In social security, on the other hand, the level of payroll taxation is set to defray costs of benefits for the *currently* retired. The social security program (for very good reasons discussed in chapter 7) has been financed on a virtual cash or pay-as-you-go basis in recent years. The accumulated reserves are sufficient to cover only approximately 1 year of benefit payments at present benefit levels. Moreover, on balance, the reserves have not increased in the last decade. It is true that most social security bills project surpluses in the distant future, but these are quickly eliminated by later legislation. Each new law contains benefits and taxes that provide a rough balance in the trust funds for the first couple of years, with surpluses projected thereafter. Before the surpluses are realized, however, benefits are liberalized, new tax rate increases are scheduled for future dates, and the cycle is repeated. In other words, the money which workers currently pay into the funds is not stored up or invested, but, is paid out concurrently as benefits to the various categories of current beneficiaries. Workers pay for benefits to eligible nonworkers. The future benefits of present workers, their dependents, or their dependent survivors will be paid in similar fashion out of the contributions of the working population as of some future date.

The fact that a fund is not accumulated at some explicit interest rate does not imply that an individual in the OASDI retirement program fails to share in the growth of the economy. Economic and population growth assures to the average individual covered by the

program an implicit rate of return in a currently financed social security system, even if tax rates are fixed. If generation 1 pays t percent of its earnings Y_1, to support retirement benefits under OASDI, then its tax burden is tY_1. Generation 2 similarly pays the same t percent of its earnings, Y_2, to support retirement benefits equal to tY_2 for generation 1. If population and the labor force grow at $100i$ percent a year and per capita earnings grow at $100j$ percent a year, then after a generation of n years, $tY_2=tY_1(1+i)^n(1+j)^n$. The implicit interest rate that generation 1 receives on its OASDI taxes under the above assumptions is 100 $(i+j)$ percent, or the sum of the rates of growth of population and per capita earnings. Generation 2 and all future generations will receive the same implicit return on their taxes as long as population and per capita earnings continue to grow at the same rates.[19]

Thus, the analogy of an individual paying for his own insurance policy with contributions based on earnings is not applicable to social security. Unlike a private insurance firm, OASDI does not have to accumulate large reserve funds to meet its future financial commitments. When benefits promised to current workers come due, the funds will be provided out of tax revenues as of that future date. The financial soundness of the social security program does not depend as it does for a private insurance firm, on prudent financial management of present premium income, but rather on the Government's effective power of taxation. The Government's ability to collect taxes sufficient to provide adequate social security benefits in the future depends critically on the maintenance of a sound Federal tax system in a healthy, growing economy. The faster the rate of economic growth, other things equal, the lighter the burden of taxation that will be required to finance any given level of future social security benefits.

If social security taxes were increased enough to result in surpluses in the Government budget that were used to create a reserve fund, the consequences for the "financial soundness" of the program would hinge on whether the process affected the rate of growth of the economy. If the economy were at, or below, a full employment level of income when social security taxes were increased, and if the Government did not take some offsetting action, the result would be a fall in the level of income and a lower rate of growth. If, on the other hand, the Government offset the surpluses by expansionary monetary policy or by increased Government capital formation, the result would be a higher rate of growth. The point is that the creation of a social security reserve fund is, in the first instance, only a transfer of monetary claims from the private sector to the Government. The ultimate effect of this initial monetary transfer depends on a great many factors; it is certainly incorrect to assume that there is a mechanism that automatically transforms a Government reserve fund into increased stock of productive capital and, therefore, increases the rate of eco-

[19] This point has been made many times, dating back to the basic article by Paul A. Samuelson, "An Exact Consumption-Loan Model of Interest With or Without the Social Contrivance of Money," *Journal of Political Economy*, vol. 66, No. 6 (December 1958), pp. 467–482. (See also Peter Diamond, "National Debt in a Neoclassical Growth Model," *American Economic Review*, vol. 60, No. 5 (December 1965), pp. 1126–1150; and Henry J. Aaron, "The Social Insurance Paradox," *Canadian Journal of Economics and Political Science*, vol. 32, No. 3 (August 1966), pp. 371–374.)

nomic growth. The above are the relevant considerations to be taken into account in planning and financing a social security program.[20] They raise difficult conceptual and pragmatic problems for overall Government economic policy—problems for which the precepts of private insurance are not relevant.

However, not all the implications of the insurance concept of social security are irreconcilable with the simple economics of the program. Consider, for example, the basic issue of whether social security benefits can be regarded as an earned right by recipients. If, in return for his own contributions to the social security funds an individual does not earn a *quid pro quo* in the private insurance sense, he does earn a *quid pro quo* in a sense that is, perhaps, even more fundamental. Since he gives up part of his earnings during his own working life to support the aged during their retirement, he has a strong moral claim to similar support from future working-age generations during his own retirement. Under social security, the individual has *moral* rights rather than *legal* rights.[21] In this sense, the benefits are earned rights, but the validity of this proposition does not in any way depend upon the insurance analogy.

The practical importance of discarding the insurance analogy is not to discredit the concept of social security, but rather to dispel basic misconceptions about certain aspects of the OASDI program. Once the insurance analogy is seen to be false, the social security "contribution" must be regarded as a tax, not an insurance premium, nor, indeed, as a "contribution" in the generally acceptable sense. The financial interchange between generations does not depend on the existence of a particular tax—the payroll tax. It arises because each generation of workers undertakes to support the eligible nonworking population and implicitly expects similar treatment.[22]

Social security payroll taxes are legally earmarked, but they are not *economically* earmarked. Congress and the President jointly have total discretion about which kinds of taxes (including those on payrolls) shall be used to pay for whatever expenditures they jointly conclude are worth making. If Congress should decide to end the earmarking of the payroll tax (but should allocate it to the general fund) and to earmark enough of, say, the corporate income tax to pay for social security benefits, nothing would be changed except some accounting. Or, if Congress should decide that all taxes are to be deposited in the general fund and then should appropriate sufficient funds each year to pay for social security, again nothing would be changed. In each case, the taxes paid by individuals and businesses would be unaltered, the amount of borrowing by the Government from the public would be unaffected, and the expenditures of the Federal Government would be the same.

Labeling the payroll tax as a contribution is sometimes regarded as a crucial factor in gaining public understanding and acceptance

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[20] For a thoughtful discussion of the implications of social security financing see John J. Carroll, *Alternative Methods of Financing Old-Age, Survivors, and Disability Insurance* (University of Michigan, 1960), chs. 1 and 3.

[21] The courts have held that "* * * the noncontractual interest of an employee covered by the act cannot be soundly analogized to that of the holder of an annuity whose rights to benefits are bottomed on his contractual premium payments" (*Flemming* v. *Nestor*, 363 U.S. 603, 1960). The only assurance that benefits will continue to be paid is congressional unwillingness to repeal the program.

[22] See Ida C. Merriam, *op. cit.*

of the program. Presumably, this practice allows individuals to connect the lowering of income now with the promise of benefits later. But, the same effect could be achieved by devices that do not involve a payroll tax. For example, a certain percentage of the individual's income tax, or of his taxable income, could be designated as a tax to support OASDI. The tax could be withheld by the employer and labeled as the "OASDI tax" on the individual's final tax return, very much as is done today with the payroll tax on the employee's W–2 withholding form. The psychological connection between the tax and promised benefits would remain intact under this alternative, without resort to the payroll tax.

The basic point that emerges from the foregoing observations is that the payroll tax is not a necessary feature of the social security system. Payroll tax receipts are part of the total revenues of the Federal Government, and should be evaluated on their merits as a source of taxes. This means that the desirability of changes in payroll taxes should be weighted against changes in other taxes and that social security benefits should be financed by the methods which are most equitable and most conducive to economic growth and efficiency.

In place of the insurance analogy, social security should be regarded as an institutionalized compact between the working and nonworking generations, a compact that is continually renewed and strengthened by every amendment to the original Social Security Act.[23] When viewed in this light, a social security program has the eminently desirable function of forcing upon society an *explicit* decision at each point of time on the appropriate division of income and consumption between workers (the young) and nonworkers (the old, survivors, and disabled). Workers and nonworkers alike participate in the democratic process that shapes this vital distributional decision. The social security system is the mechanism by which society settles the issue of intergenerational (worker-nonworker) income distribution through the political process rather than leaving its resolution to private decisions and the market.

This last point is more general than the narrow issue of preventing poverty among the aged. Consider two workers, A and B, who always earned at least the maximum taxable wage and thus qualify for the maximum benefit; however, A is married to a woman aged 65 or older while B is unmarried. These two workers are treated most unequally. The benefit paid to A (and his wife) is 50 percent greater, while they are both living, than the benefit paid to B; and a widow's benefit is payable after A's death, while only a small lump-sum payment is paid to B's survivors (as it is also to A's), despite the fact that, by assumption, each had equal earnings before retirement and the question of poverty is not at issue. The wife's benefit is an extremely important, *explicit* redistributional device that has no connection with the problem of poverty. In short, the benefit structure under OASDI is, like the system of personal exemptions under the personal income tax, a

[23] The outstanding statement of this view of social security is by Paul A. Samuelson, "An Exact Consumption-Loan Model of Interest With or Without the Social Contrivance of Money," *op. cit.*, pp. 479–482. The best introduction to social security for the serious student is the entire Samuelson article and the later exchange, "Consumption-Loan Interest and Money," "Reply," and "Rejoinder," in *Journal of Political Economy*, vol. 67, No. 5 (October 1959), pp. 512–525, between Samuelson and Abba P. Lerner concerning some points raised by the article.

means by which society can adjust the distribution of income that results from the workings of the private market for nonmarket, welfare considerations, such as family size.

Summary

The case for social security rests on a solid basis. Given widely accepted humanitarian values and a few fundamental facts about economic behavior in our culture, it follows that the Government should maintain and continually strengthen the social security system to protect individuals from severe declines in living standards in retirement and against other risks. To serve the purposes which justify its creation, the system should be financed by the best methods available to the Government at any given time; it should guarantee minimum benefits sufficient to keep beneficiaries out of poverty; and it should pay benefits above the minimum level determined, at least in part, by the previous income or earnings experiences of beneficiaries.

Two basic features of the social security system which are widely approved and help to explain the public's acceptance of the system as a desirable permanent public institution can be traced to the analogy with private insurance. These features are the belief that benefits are earned rights to which no stigma attaches, and that they depend at least in part on past earnings of participants. The insurance analogy is misleading, however, in fundamental respects. On the assumption that the trust funds will continue to be financed approximately on a current basis, the currently employed will always be taxed enough to pay for the benefits of those who are retired. The practical importance of distinguishing between social security and private insurance is that it forces the major elements of the social security system—taxes and benefits—to be considered in the appropriate perspective. Benefits of the currently retired need not, and should not, depend on their past taxes; they should be based on an explicit decision reached by democratic political processes as to how much of the Nation's total income should be allocated for retirement benefits. Similarly, the tax should not be regarded as an insurance premium, but rather as a financing mechanism—to be judged on its own merits—for a large, essential Government program.

ISSUES IN FUTURE FINANCING OF SOCIAL SECURITY

BY GEORGE A. BISHOP*

CONTENTS

TABLES AND CHARTS

*Director, Federal Affairs Research, Tax Foundation Inc., New York.

NOTE: The views expressed in this paper are the author's and do not necessarily reflect the views of the Tax Foundation.

I. Introduction and Summary

In 1966 a group of Senators introduced a bill providing for a 50-percent increase in old-age retirement benefits, and liberalization of other social insurance benefits.[1] This increase would be financed in part by higher payroll taxes coming mainly from a rise in the maximum taxable wage to $15,000. The bill also included a proposal for the use of general revenues to meet a portion of the costs. Eventually over one-third of social security trust fund outlays would be borne by sources other than payroll taxes.

This bill was an indication of current pressures at work to modify social security. It went much further than the administration's proposals introduced in January 1967, and these provided for substantial amendments to the Social Security Act. The administration's proposals were modified and scaled down in the bill reported by the House Ways and Means Committee on August 7, 1967 (H.R. 12080). This bill provided for a 12½-percent increase in benefits, an increase in the amount an individual may earn and still get full retirement benefits, and various other modifications of benefits. To finance these increased benefits, the taxable earnings base would be increased from $6,600 to $7,600 effective January 1, 1968, and tax rates in future years would be changed as shown in table 1.

TABLE 1.—OASDHI [1] TAX RATES AND MAXIMUM TAX BASE UNDER EXISTING LAW, UNDER ADMINISTRATION'S PROPOSALS OF JANUARY 1967 AND UNDER H.R. 12080 AS REPORTED BY THE HOUSE COMMITTEE ON WAYS AND MEANS, AUGUST 1967, 1967 ACTUAL, 1968–74 SCHEDULED OR PROPOSED

Year	Scheduled under existing law			Administration's 1967 proposals [2]			H.R. 12080 as reported by the Committee on Ways and Means, August 1967		
	Maximum taxable wage	Combined tax rate on employer and employee [3]	Tax rate on self-employed [3]	Maximum taxable wage	Combined tax rate on employer and employee [3]	Tax rate on self-employed [3]	Maximum taxable wage	Combined tax rate on employer and employee [3]	Tax rate on self-employed [3]
1967	$6,600	8.8	6.4	$6,600	8.8	6.4	$6,600	8.8	6.4
1968	6,600	8.8	6.4	7,800	8.8	6.4	7,600	8.8	6.4
1969	6,600	9.8	7.1	7,800	10.0	7.3	7,600	9.6	6.9
1970	6,600	9.8	7.1	7,800	10.0	7.3	7,600	9.6	6.9
1971	6,600	9.8	7.1	9,000	10.0	7.3	7,600	10.4	7.5
1972	6,600	9.8	7.1	9,000	10.0	7.3	7,600	10.4	7.5
1973	6,600	10.8	7.55	9,000	11.1	7.55	7,600	11.3	7.65
1974	6,600	[5] 10.8	7.55	10,800	[4] 11.1	7.55	7,600	[4] 11.3	7.65

[1] Old age, survivors, disability, and hospital insurance.
[2] Set out in H.R. 5710.
[3] Includes portion of rate for hospital insurance (in which no change in the existing schedule was proposed by the Administration in 1967). The hospital portion is scheduled to rise from 1 percent in 1967–72 to 1.1 percent in 1973.
[4] Further increases are scheduled to 11.6 percent (H.R. 5710) or 11.8 percent (H.R. 12080) in 1987.
[5] A further increase is scheduled to 11.3 percent in 1987.

Source: Social Security Administration.

[1] Congressional Record, Senate, vol. 112, No. 122, 89th Cong., 2d sess., July 28, 1966, pp. 16605–16612. The bill (S. 3661) was introduced by Senator Robert Kennedy and sponsored by eight other Senators.

The process of liberalizing social security benefits is likely to continue, bringing with it a continued increase in social security taxes. This prospect raises important questions which the present study tries to answer at least in part. Among these questions are the following:

(1) Is the tax burden of caring for the aged likely to become unduly heavy?

(2) More specifically, is the burden of taking care of the aged likely to strain the limits of the payroll tax? In other words, has the payroll tax about reached the upper limit to which it can be pushed?

(3) Have we substantially abandoned the contributory principle in favor of a "social adequacy" concept in OASDI [2] programs?

(4) What are the alternatives in attempting to resolve the conflicts between "social adequacy" and the strains of increasing payroll taxation?

These are the major questions examined here. Other questions touched on include the following: Do recent increases in social security benefits call for a substantial change in the present income tax treatment of the aged? It is likely that the expansion of social insurance will endanger the growth of private pension plans and private provision for old age through other means? How are OASDI programs to be related to direct welfare programs?

Prof. Eveline Burns, of Columbia University, in a recent article entitled "Social Security in Evolution: Toward What?" has distinguished three stages in the evolution of social insurance in most Western countries.[3] The first she described as follows:

> . . . the initial form in which social insurance bore everywhere the imprint of its private insurance analogy. Benefits were closely related to contributions; equity, rather than adequacy, which scarcely came into question, was emphasized; coverage was limited to the best risks with sizable previous employment records; and the costs were assessed solely on the potential beneficiaries and their employers.

Stage II she described as characterized by: "* * * almost irresistible pressures to extend coverage—to additional persons and additional risks—and these extensions would in turn modify the principles and policies governing eligibility, benefits, and methods of financing. As the poorer and more irregularly employed were brought into the system, the strict relationship between benefits and earnings would become evermore untenable because of the necessity to insure a meaningful benefit to covered workers with low earnings. [The latter part of stage II would be marked by consideration of] * * * the desirability of a contribution from the general revenues."

Finally, stage III would be reached when "* * * thanks in large measure to the widespread of social insurance, there was general ac-

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[2] OASI refers to the old-age and survivors insurance program which dates from 1935 (and the 1939 amendments which included survivors insurance). OASDI includes in addition the disability insurance program which was adopted by the 1956 amendments to the Social Security Act.

[3] *Canadian Tax Journal*, July–August 1966, pp. 326–336. Professor Burns had originally set out these stages in a paper, "Social Insurance in Evolution," *American Economic Review Supplement*, vol. 34 (March 1944), pp. 199–211.

ceptance of the doctrine of public assurance, without a means test, of a minimum income for all.'"

The evolution Professor Burns has described is certainly not immutable. While it is not an exact description of the growth of social security in the United States, her outline does indicate possible directions of change. The present study is mainly concerned with the question of alternatives to following such stages further in the United States.

The changes in social security considered by Congress in 1967 involved a multitude of issues of benefit levels for various groups, changes in the maximum taxable income base, changes in the maximum earnings limit for retirement benefits, and so forth. No attempt is made here to examine all of these issues, or to deal with unemployment insurance or direct public welfare programs (such as general old-age assistance, aid to dependent children, and aid to the blind) covered in proposed social security amendments.

Rather, the focus of the study is on questions of long-term financing of OASDI programs. Limits on payroll taxation are considered, and alternative ways of revising the present basis of financing are examined.

In summary form the answers suggested to the major question listed above are as follows:

(1) *The future tax burden for the aged.*—The most recent projections of the Bureau of the Census indicate that the ratio of the population aged 65 and over will remain nearly a constant proportion (about 18 percent) of the population aged 20 to 64 through 1985. Thus the burden on the working population will depend primarily on the extent to which retirement and other benefits to the aged are increased in relation to average wages and salaries. Unlike some other countries, the United States is not currently in the position of having to shoulder an increasing tax burden because of a substantial rise in the proportion of the aged to the working population.

(2) *Is the burden of taking care of the aged likely to strain the limits of the payroll tax? Has the payroll tax about reached the upper limit to which it can be pushed?*

While the proportion of the aged to the working population will not change substantially in the next few decades, it is likely that Congress will endeavor to improve the economic position of the aged and to extend the range of risks covered by OASDI programs. Such changes could well require significant increases in payroll taxes in excess of those already scheduled under present law.

Under existing law the combined employer and employee tax rate is scheduled to reach 9.8 percent of taxable wages up to $6,600 in 1969, and under the bill currently pending in Congress (H.R 12080) the rate would reach 9.6 percent of $7,600. The scheduled rate in H.R. 12080 will exceed 11 percent of taxable wages by 1973. The maximum tax on an employee in 1968 would be increased from $290.40 under present law to $334.40 under H.R. 12080. The maximum combined tax on employer and employee would increase from $580.80 to $668.80.

These are heavy taxes on an income of $6,600 or even $7,600. By way of comparison, a family with two children and an income of $5,000 in 1967 would pay a Federal income tax of $306 (assuming standard deductions). If this family had more than one wage earner, its direct payroll taxes would exceed its income tax.

The employee also bears some part of the employer's portion of the tax whether the tax is assumed to be shifted forward in the prices of goods and services or to be shifted backward in the form of lower money wages. (It is also possible that some portion of the tax falls on profits and other nonwage income.)

Moreover, a combined payroll tax rate approaching 10 percent of taxable wages is likely to have significant effects on business decisions on investment in capital equipment, and on the hiring of unskilled workers. A 10-percent tax on labor may intensify problems of unemployment or partial unemployment among those groups whose unemployment rate is already high.

The level of the payroll tax may be limited by another type of consideration. It would not be reasonable, in the view of many people, to levy social security payroll taxes at a rate in excess of what benefits of a similar nature would cost if the employee were to provide them through private forms of saving and insurance.

The payroll tax has risen to a level such that if a young worker today, with earnings at least equal to the maximum taxable base, computed the total of his expected payroll taxes plus interest over his lifetime, the value of his "contributions" would in many cases substantially exceed the discounted value of his expected benefits.

While experts differ in their views of how these calculations should be made, such comparisons suggest a definite kind of limit to payroll taxes. Young workers who begin to find themselves in this situation can be expected to offer more and more objection to increased payroll taxes.

Moreover, a general economic question is involved. It concerns allocating to social insurance, through payroll taxes, resources that would have more value in the purchase of private insurance and pensions.

The significance of such a limitation may be disputed by those who point out that the insurance analogy is a very loose one and the objective of "social adequacy" is more important. This leads to the third major question dealt with in this study:

(3) *Have we substantially abandoned the contributory principle in favor of a "social adequacy" concept in OASDI programs?*

From the beginning, the old-age and survivors insurance program was a mixed system aimed in part at relating contributions to benefits ("individual equity") and in part at making benefits "adequate" in terms of rough standards of minimum consumption levels. These two concepts of "social adequacy" and "individual equity" are generally conflicting, because very low income groups cannot be expected to pay a full "price" for the benefits provided under social security.

The old-age benefit structure, moreover, is heavily weighted in favor of those with low earnings records. The old-age retirement benefit in 1966 amounted to 62.97 percent of the first $110 of average monthly covered wages, plus 22.9 percent of the next $290 of average monthly covered wages, plus 21.4 percent of the remainder.

In addition, the provisions for minimum amounts of monthly benefits give the system a strong emphasis on social adequacy. The pressure to go further in this direction was illustrated by the 1967 proposal of the Administration to raise the minimum old-age retirement benefit from $44 per month to $70 per month. Such an increase would have been almost exclusively based on the concept of social adequacy. In fact, the Ways and Means Committee modified this proposal to provide

a minimum benefit of $50 per month, at least partly on the grounds that an increase in the minimum to $70 would be too great a departure from the principle of a wage-related, contributory system.

In short, while we have not entirely abandoned the contributory principle in that benefits and administrative costs in the aggregate are paid for through payroll taxes, the financing of these programs has, in the course of time, put less emphasis on the relation between the *individual's* contributions and the benefits *he* will receive.

(4) *What are the alternatives in attempting to resolve the conflicts between "social adequacy" and the strains of increasing payroll taxation?*

Recent debates and pressures for change suggest various possibilities for revision in OASDI financing. Four major alternatives are examined here:

(*a*) Continue approximately the present balance between the objectives of social adequacy and individual equity, accepting the possibility of increased conflicts and strains as the payroll tax rate and base increase.

(*b*) Provide a general revenue contribution to OASDI trust funds with a probable increase in the emphasis given to social adequacy.

(*c*) Modify the payroll tax by substantially increasing the maximum taxable wages or by introducing an exemption to reduce the burden on low income groups.

(*d*) Separate the benefits schedule in two portions, one of which would be closely related to contributions on an individual equity basis, and a second which would explicitly be based on adequacy considerations and be financed separately by general revenues.

The choice among these alternatives depends in part on value judgments concerning the relative importance of the objectives involved. However, technical and economic issues are also involved. The chief issues of both kinds in brief are as follows:

(*a*) *Maintaining the present system.*—Through a long political process the United States has developed a social insurance system that provides a working balance between the objectives of adequacy and individual equity. This balance is being strained as the payroll tax burden grows. Some view this "strain" as a useful restraint on excessive expenditures for benefits.

On a more technical level, the present system of payroll tax financing contains an important fiscal control device. The system requires the levying of additional payroll taxes at the same time that increased benefit levels are adopted, and the taxes are set so as to meet expected benefits and administrative costs over a long period. This is a device that is often absent in the Federal Government's general budget, although similar procedures have been proposed for administrative budget programs.

A general revenue contribution to OASDI trust funds could be fitted into the same type of fiscal control procedure. For example, any proposed increased levy for social security could require an increase in income taxes earmarked for OASDI trust funds. Even with such a procedure, benefits might increase faster than with exclusive reliance on the payroll tax both because income tax revenues are more responsive to economic growth and because Congress might be more ready to use an income tax levy than a payroll tax increase to raise the

benefit schedule. Until recently, however, the payroll tax was relatively low. People generally appear to have had an exaggerated idea of the extent to which they were paying for their own benefits. The increase in benefits may have seemed of more significance to the public generally than the increase in taxes.

The attitude toward payroll taxes could change markedly. At current and prospective payroll tax levels, an income tax increase for the purpose of raising benefits levels might seem to be an easy way out of the conflict between adequacy and individual equity.

(*b*) *Providing a general revenue contribution.*—Many who argue for a general revenue contribution do so because they want a large increase in social security benefits. They see such a contribution as a means of raising benefits to more "adequate" levels in relation to minimum family budget standards.

Moreover, it is argued that not only is the payroll tax high, but that this is a poor way to finance increases in benefits. If the OASDI system is to become an instrument for preventing or removing poverty, it would hardly be fair to do so with a payroll tax that reaches its maximum at $6,600 or $7,600. An increased emphasis on social adequacy would more logically be achieved through taxes levied on the general taxpayer.

Historically, another argument has been used for a general revenue contribution. It is that in the transitional stage to a "mature" social insurance system, most people become eligible for benefits even though they have not "contributed" anything like the full cost of those benefits. Until most workers have contributed during a full working lifetime at rates commensurate with the benefits they will receive, there is a large windfall accruing to current beneficiaries. This windfall, it is argued, constitutes an "unfunded liability" the burden of which should be borne by all taxpayers through revenues rather than through the payroll tax alone. Use of the payroll tax is largely justified by the relation between an individual's contributions and his benefits, so that the "redistribution" in favor of current beneficiaries receiving windfalls should be met by a general levy.

(*c*) *Modifying the payroll tax.*—A closely related proposal is to modify the payroll tax to make it more like an income tax: to allow personal exemptions and to increase substantially the maximum wage base. This would relate the tax burden more closely to "ability to pay" and check the increasing "regressivity" of the total tax structure that goes with increased reliance on the payroll tax.

A higher maximum wage base would also mean increased benefits. Under the present benefit structure, which is heavily weighted in favor of those with low earnings records, a higher maximum tax base would serve to increase the emphasis on social adequacy. Benefits would go up for those earning as much or more than the maximum taxable wage, but not in proportion to the increase in wages or payroll taxes.

Such an alternative would depart further from the contributory, or "individual equity," basis of financing.

(*d*) *Separating the benefit schedule and its financing into two portions.*—The conflict between the objectives of social adequacy and individual equity suggests the possibility of separating the major elements in OASDI programs designed to meet these different objectives: one which would emphasize "insurance" elements, and another which would emphasize welfare or adequacy elements.

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In the broadest terms, the "welfare" element consists of that part of benefits which is determined primarily on the basis of adequacy—in particular, the minimum benefits which bear no relation to average covered wages of the beneficiary except that covered wages must be very low. The "insurance" element consists of that part of benefits which is, or can be, related to average covered wages. Such a separation would involve a substantial revision of the benefit structure and raise many problems of defining an appropriate relation between benefits and the individual's contributions.

Some countries have developed social security systems which distinguish more clearly than in the United States between contributory social insurance programs and other forms of social security. Canada, for example, now has a two-tier system consisting of a universal old-age pension, financed by a surcharge on the individual income tax, the corporation income tax, and the Federal sales tax, plus a contributory "Canada pension plan" financed by payroll taxes much more closely related to benefits than in the United States. Each part of the system is financed through a separate trust fund. Thus the "fiscal control" element is present in both parts of the system.

A separation of insurance elements means a greater reliance on the benefit principle of taxation. The economic argument here is as follows: Where the benefits of public expenditures go to specific groups of individuals, and where taxes for the support of these expenditures can be effectively levied on these same groups, the public will, on the whole, be better off than if these expenditures were financed out of general revenues.

Isolating an insurance element in social security raises questions of whether there are insurable risks that are unlikely to be met by private enterprise and private saving, and for which compulsory coverage by a governmental system may be justified.

From the beginning of the social security system, compulsory provision for old age has been justified in part by the argument that without such provision many of the aged would become public charges. This argument still has relevance in a period of growing incomes and substantially full employment though perhaps less than in the 1930's. As family income increases, provision for their own retirement becomes one of the services that more and more people want to buy.

Forcing people to save through social insurance may appear to be an undue interference with individual choice. However, the evidence seems to be that social security has had the effect in the past of heightening people's awareness of the need for saving for old age and protection against risks of death and disability. Whether or not this effect may continue is another matter. If social security taxes continue to rise, the ability of people to save in other ways may be limited. It would not seem reasonable to compel purchase of Government insurance on a scale that would check the growth of private provision for old age.

However, the arguments may be arrayed on the question of compulsory saving for old age, at least a minimum of such compulsion is accepted in most Western countries. Acceptance of such compulsion seems to be a part of the decline of dependence on the family as an old-age security system.

Certain limitations of private provision for old age continue to provide a justification for a governmental system. Even though an em-

ployee might not choose to save toward his old age, some portion of the cost of a minimum old-age pension has come to be regarded as a necessary part of the cost of production of goods and services.

Our social insurance system compels nearly every employer as well as his employee to contribute to OASDI. The employee remains covered and, in a sense, received credit for his and his employer's contribution no matter how often he changes jobs. These features of quick "vesting" of pension and insurance rights and of "portability" are the very features that are difficult to provide for all employees under existing private pensions.

This difference between private and "social" systems is due in part to the fact that the building up of investment reserves is the essential means by which private pension plans insure that funds will be available for pensions when covered employees retire. A social insurance system with nearly universal coverage does not need this device to insure payment. The Government's promise to pay, although not in the form of a contract, is sufficient for most people, and it is backed primarily by the power to tax rather than by a reserve fund. For this and other reasons, Congress has, in effect, accepted a virtual pay-as-you-go system with only limited reserves for contingency purposes.

A pay-as-you-go social insurance system is a current taxing process to meet current benefit payments and expenses. This process may have little effect on the national rate of saving and investment; if anything, the effect is to reduce the rate of national saving because those who currently pay taxes are generally net savers, while beneficiaries generally are dissaving. Private pension funds, on the other hand, according to recent studies, have a substantial effect in increasing the national rate of saving. This consideration would become important if social insurance were provided on such a scale as to check the growth of private pension funds or private saving in other forms.

A separation of "welfare" and "insurance" elements in OASDI programs could mean a more efficient and more equitable financing system. But, it would be difficult to accomplish. It would involve complex problems of relating benefits to contributions; some value judgments on the importance of the objectives of "social welfare" and "individual equity"; and basic economic and political decisions in drawing an appropriate line between social and private insurance.

Sections II and III provide a brief review of the expansion of social insurance in the United States and of shifts in the financing principles involved. Section IV presents major alternatives or possibilities for revising the present system of financing OASDI programs. Section V examines in more detail the last alternative described above; namely, a possible separation of major welfare and insurance elements in OASDI programs. This alternative has so far received very little consideration in the United States.

II. Expansion of Social Insurance, Future Costs, and Limits to Payroll Taxation

Governmental policies toward the aged took a sharp turn in the mid-1930's with the adoption of the essential basis of the present social security system. This history of social security has been told and analyzed

in a voluminous literature.[1] For the purpose of the present study, only a few of the major changes in the early history need be noted. However, some substantial changes in the past two decades need more emphasis than they have so far received.

GROWTH OF SOCIAL INSURANCE IN THE UNITED STATES

The Social Security Act of 1935 embodied a program for old-age retirement benefits supported by payroll taxes levied in equal amounts on the employer and employee in industry and commerce.[2] Benefits for dependents and survivors were added in 1939.

The initial maximum wage base, which remained unchanged until 1951, was $3,000. The initial tax rate was 1 percent on the employer and 1 percent on the employee. This rate remained unchanged until 1950 (table 2).

TABLE 2.—MAXIMUM TAX BASE, COMBINED TAX RATE, AND MAXIMUM TAX ON EMPLOYER AND EMPLOYEE FOR OASDHI [1] 1937–67 ACTUAL, 1968–87 AS SCHEDULED IN SOCIAL SECURITY AMENDMENTS OF 1965

Year	Maximum taxable base	Combined tax rate [2] (percent)	Maximum tax	
			Combined employer-employee [3]	Employee only [3]
1937–49	$3,000	2.0	$60	$30
1950	3,000	3.0	90	45
1951–53	3,600	3.0	108	54
1954	3,600	4.0	144	72
1955–56	4,200	4.0	168	84
1957–58	4,200	4.5	189	95
1959	4,800	5.0	240	120
1960–61	4,800	6.0	288	144
1962	4,800	6.25	300	150
1963–65	4,800	7.25	348	174
1966	6,600	8.4	554	277
1967–68	6,600	8.8	581	290
1969–72	6,600	9.8	647	323
1973–75	6,600	10.8	713	356
1976–79	6,600	10.9	719	360
1980–86	6,600	11.1	733	366
1987 and after	6,600	11.3	746	373

[1] Old age, survivors, disability, and hospital insurance. Disability not included until 1956; hospital insurance, not until 1966.

[2] Beginning in 1951, the self-employed covered by the system were subject to a rate equal to three-quarters of the combined rate on employer and employee.

[3] Rounded to nearest dollar.

Source. Social Security Administration.

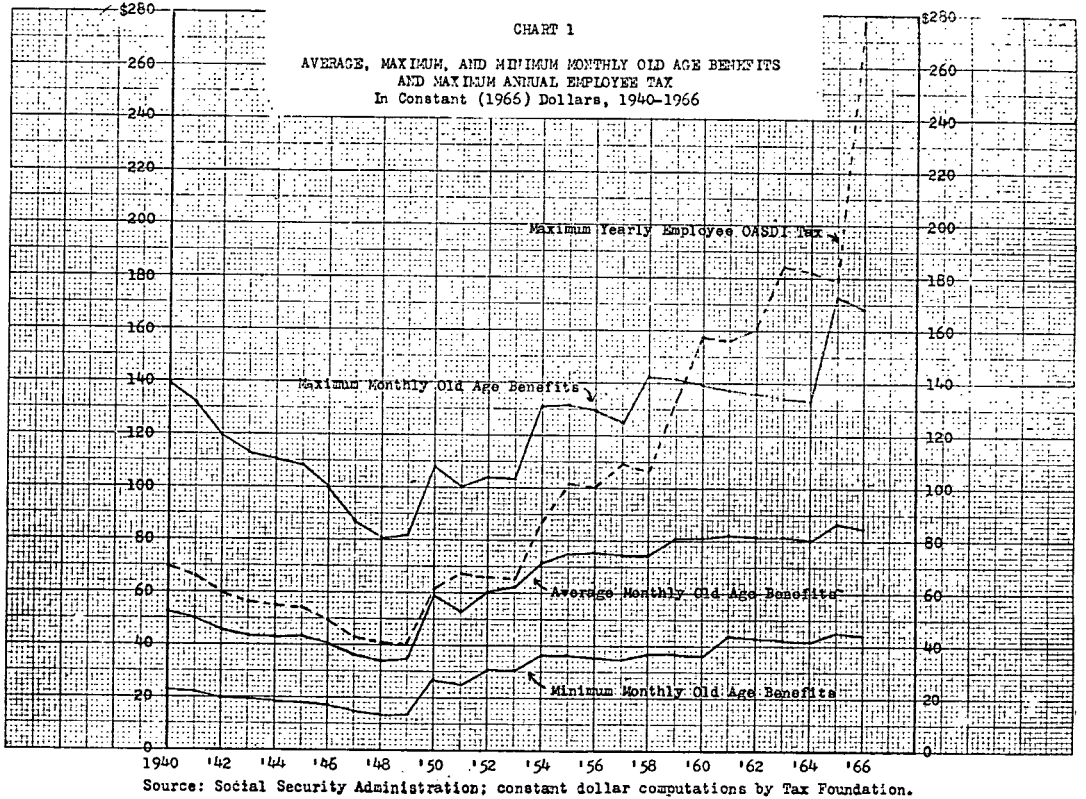
In constant dollars, the maximum tax payable fell until 1950 (because of the fixed tax rate and ceiling on the tax base). Since that date, the maximum tax has increased very substantially in constant dollars, and much more than the average, maximum, and minimum monthly benefits (chart 1).

[1] U.S. Department of Health, Education, and Welfare, *Basic Readings in Social Security* (Washington, D.C., 1960), a bibliography of basic references. (See also Tax Foundation Research Bibliography No. 20, *The Social Security Payroll Tax*, and Research Publication No. 5, *Economic Aspects of the Social Security Tax*, pp. 9–20.)

[2] The Social Security Act covered a wide range of programs in addition to old-age insurance. The various public assistance programs and unemployment insurance are not examined in this study.

CHART 1

AVERAGE, MAXIMUM, AND MINIMUM MONTHLY OLD AGE BENEFITS
AND MAXIMUM ANNUAL EMPLOYEE TAX
In Constant (1966) Dollars, 1940-1966



Source: Social Security Administration; constant dollar computations by Tax Foundation.

No substantial change in coverage was made until 1951 when self-employed (except farmers and professional people) were included along with certain other groups. Other changes in coverage are shown in table 3.

TABLE 3.—MAJOR CHANGES IN COVERAGE UNDER OASDI [1] 1935–66

Effective date	Compulsory coverage added	Elective coverage added
1937	All workers in commerce and industry, except railroads, in continental United States, Alaska, and Hawaii.	None.
1951	Self-employed (except farm and professional), regularly employed farm and domestic workers, Federal civilian workers not under retirement program, Americans employed outside United States by American employers, residents of Puerto Rico and Virgin Islands.	State and local government employees not under retirement system, employees of nonprofit institutions.
1955	Farm self-employed, professional self-employed (except lawyers and medical professionals), most farm and domestic workers.	State and local government employees under retirement system, ministers.
1956	Lawyers, dentists, optometrists, chiropractors, osteopaths, veterinarians, and other medical professionals (except doctors of medicine), materially participating farm-landlords, Armed Forces.	
1961	Residents of Guam and American Samoa, Peace Corps volunteers.	
1965	Doctors of medicine	

[1] OASI only prior to 1956; OASDI prior to 1966.

Source. Social Security Administration and Tax Foundation, "Economic Aspects of the Social Security Tax" (New York: 1966).

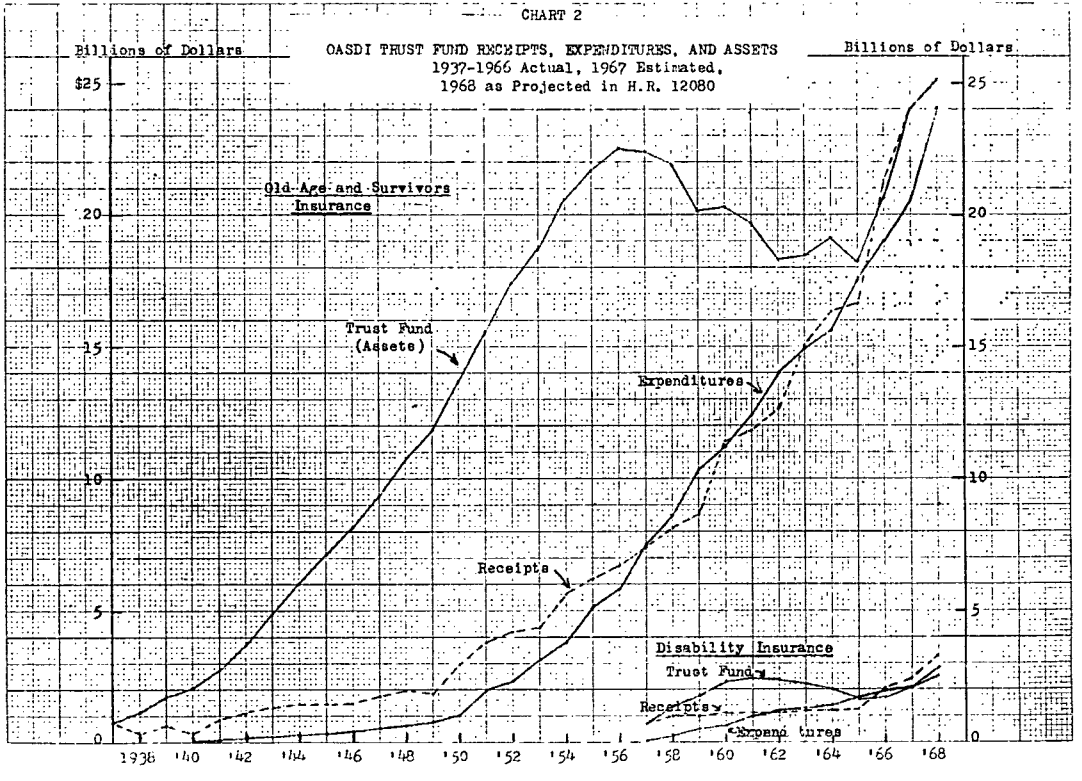
In 1955 coverage was substantially broadened to include farmers, most professional, self-employed people, and State and local government employees (on an elective basis) whether or not they were covered by State and local retirement systems. At the same time, the maximum tax base was raised to $4,200.

By 1966 the combined employer-employee rate was up to 8.4 percent and the maximum tax base was $6,600. The 1966 tax increase was the largest increase in the history of the act.

Over the first 20 years of operation, the assets of the trust funds accumulated to $23 billion, and thereafter fell off somewhat (chart 2). The trust fund assets are expected to increase substantially again in the future under present law. The rate of growth, however, is likely to be smaller than the rate in the years prior to 1956.

CHART 2

OASDI TRUST FUND RECEIPTS, EXPENDITURES, AND ASSETS
1937-1966 Actual, 1967 Estimated,
1968 as Projected in H.R. 12080



The most significant change in the system since 1956 was the addition in 1966 of health insurance for those aged 65 and over. Health insurance (popularly known as medicare) is a two-part program, one of which, the "basic" program, is compulsory and financed by a separate portion of the tax rate amounting in 1967 and 1968 to 0.5 percent for the employee (and also for the employer and self-employed). The basic program provides certain inpatient hospital services, post-hospital home health visits, posthospital extended care facility services (i.e., skilled nursing homes), and outpatient diagnostic services. The second part of the program is a supplementary medical insurance plan which covers the major part of the doctors' bills and certain other services for those 65 and over. This portion of the program is financed jointly by monthly contributions of persons who elect to participate and by a contribution from general Government revenues.

The addition of health insurance was not only a major departure in the *kind* of risks covered, but also was the first use of *voluntary* type program and of a continuing *general revenue* contribution.

PROBABLE FUTURE COSTS

Increased social security benefits and the expansion of the kinds of risks covered suggest that in the future we will be paying a heavy tax burden for the support of the aged.

The question of the future size of the tax burden for social security type programs is at least as important as the closely related questions of how that burden is to be allocated among different groups of people and types of taxes.

Total social security tax collections have risen rapidly, not only in absolute terms, but also as a percentage of total Federal tax collections. In 1949 OASI tax collections amounted to 4.1 percent of the Federal total; by 1967 the share had risen to 16 percent. This shift is a substantial change in the Federal tax structure.

Are we likely to see this share continue to rise substantially?

POPULATION PROJECTIONS

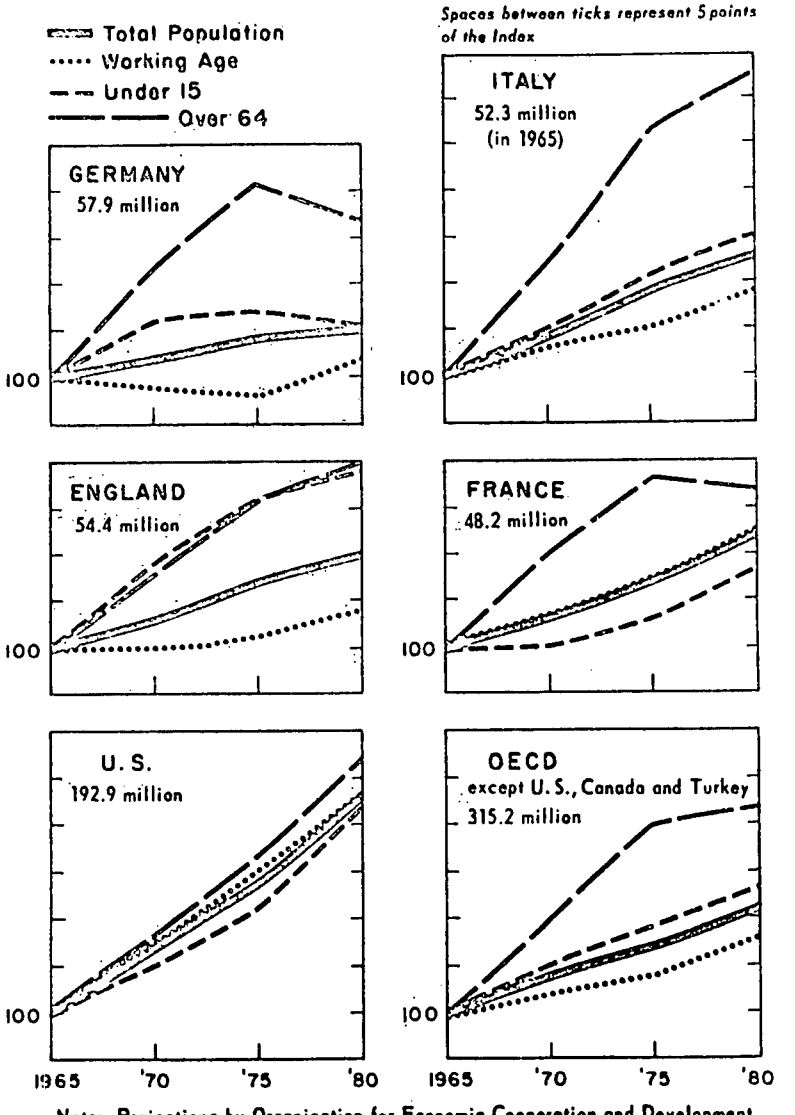
The first step in answering this question is to look at the prospective growth in the aged population as compared with the total population and the labor force. A recent set of charts published by the National Industrial Conference Board shows that, as compared with the countries of Western Europe, the United States is in a relatively easy position in the ratio of dependent to working population (chart 3). Over the next decade and a half the number of people aged 65 and over in the United States will rise almost in the same proportion as those of working age, while the younger age groups will increase less rapidly (table 4). In Western Europe, by contrast, the population aged 65 and over will increase relatively much more than the working population.

CHART 3

Growth in Population

U. S. and Key European Countries

Indexes, 1965 = 100



Note: Projections by Organization for Economic Cooperation and Development
Population excludes migration. Data as of January 1 of years shown

Sources: OECD; The Conference Board

TABLE 4.—PROJECTIONS OF THE U.S. POPULATION BY BROAD AGE GROUPS, 1965–2050

Year	Population (in thousands)				65 and over as—	
	Under 20	20 to 64	65 and over	Total	Percent of total	Ratio of 20 to 64
LOW-COST PROJECTION						
1965	80,139	103,209	18,711	202,059	9.3	.181
1970	82,400	111,500	20,296	214,196	9.5	.182
1975	85,840	121,245	22,016	229,101	9.6	.182
1980	90,313	131,858	24,044	246,215	9.8	.182
1990	106,181	149,144	28,185	283,510	9.9	.189
2000	119,023	174,838	29,577	323,438	9.1	.169
2010	133,672	204,336	31,753	369,761	8.6	.155
2020	151,593	227,542	41,382	420,517	9.8	.182
2030	169,386	255,057	50,437	474,880	10.6	.198
2040	190,189	289,091	54,151	533,431	10.2	.187
2050	213,160	322,410	62,426	597,996	10.4	.194
HIGH-COST PROJECTION						
1965	80,139	103,209	18,711	202,059	9.3	.181
1970	81,868	111,580	20,405	213,853	9.5	.183
1975	82,629	121,439	22,304	227,372	9.8	.184
1980	85,331	132,195	24,585	242,111	10.2	.186
1990	93,489	149,303	29,458	272,250	10.8	.197
2000	98,353	171,142	31,756	301,251	10.5	.186
2010	103,111	193,385	34,706	331,202	10.5	.179
2020	109,756	205,170	45,386	360,312	12.6	.221
2030	115,348	215,544	55,678	386,570	14.4	.258
2040	121,520	229,968	58,470	409,958	14.3	.254
2050	128,087	241,154	63,209	432,450	14.6	.262

Source: Reproduced from "United States Population Projections for OASDHI," Social Security Administration Actuarial Study No. 62, December 1966.

The difference is not quite so significant as these figures would suggest because the increase in the labor force in the United States will consist, relatively more than in Western Europe, of the younger age groups whose average productivity is lower; indeed, in the United States the number in the group 45 to 65 will scarcely increase at all.

In short, so far as mere numbers are concerned, the problems of meeting the needs of the aged in the United States will be no greater than in the past. There are also other influences working to reduce the public burdens for the aged. One is the expansion of private pension funds and a general improvement in the income and asset position of the aged. On the other hand, the aged represent a large fraction of the "poor" in this country, and efforts to raise their relative, as well as their absolute living standards, could substantially increase the burden.

OFFICIAL COST AND BENEFIT ESTIMATES

A chief function of the Office of the Actuary in the Social Security Administration is to make both long- and short-range estimates of future benefits, administrative costs, and contributions under social security programs.[3]

These estimates are usually made on the basis of the existing level of wages and the level of benefits under existing or proposed legis-

[3] The latest of these studies is *Long-Range Cost Estimates for Old-Age Survivors and Disability Insurance,* 1966, Actuarial Study No. 63, January 1967.

lation. On the "level wage" assumption—i.e., the general level of wages is assumed to stay constant—account is taken of projected changes in population by age group and the likely numbers of beneficiaries and their average benefit levels.

The latest projections show a sizable increase in the OASDI trust funds. On the basis of these projections, there have been proposals to limit increases in benefits in the near future to levels that would merely use up the prospective growth in contributions as the population increases, and involve no tax rate of maximum wage base increase.[4]

While the "level wage" assumption is the actuarial procedure officially sanctioned for long-range estimates, it obviously leaves open the questions of what the effects will be of rising wage and price levels, and of increased levels of benefits that very likely will be adopted in the future.

Short- and intermediate-range projections are made on the assumption of increasing wage levels, but for the purpose of estimating fiscal effects rather than determining contribution rates. The short-range estimates are important for purposes of economic policies affecting stability and growth in the near future. The long-range estimates affect primarily the determination of contribution rates and the distribution of the costs or burden of the program.[5]

The level wage assumption builds a moderate safety factor into the cost estimates. More importantly, it is argued that long-range cost estimates (in the United States) are for a fixed schedule of benefits related to current economic conditions. Consequently, it would be illogical to use an increasing earnings assumption without also using a "dynamic" assumption about benefit levels; and to do this would involve the actuary in the difficult task of projecting future legislative changes in benefits. An increasing earnings assumption would be appropriate only if the benefit schedule in the law were also "dynamic"; i.e., automatically adjusted for changes in earnings levels.[6]

However, for at least two reasons use of the level wage assumption may be questioned. The first is that recent economic and legislative history shows that realistically a "dynamic" benefit structure must be taken into account. It can be argued that the most relevant set of assumptions for actuarial analysis of social security financing—and thereby for determining the allocation of costs— is the "dynamic" set which takes account both of increasing wage levels and prospective increases in benefit levels. (See appendix.)

The second reason is that since more and more economic policy decisions, both public and private, are based on long-range projections that take account of likely price increases as well as growing levels of

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[4] The U.S. Chamber of Commerce and the National Association of Manufacturers took this position in statements before the House Ways and Means Committtee in 1967.

[5] For further discussion see Henry Aaron, "Benefits Under the American Social Security System," in Otto Eckstein, ed. *Studies in the Economics of Income Maintenance* (Washington, D.C.: The Brookings Institution, 1966), pp. 53–61. For an explanation of the long-range methodology see Robert J. Myers, *Social Insurance and Allied Government Programs* (Homewood, Ill.: Richard D. Irwin, Inc., 1965), ch. VIII.

[6] Robert J. Myers, "The Applicability of Projected Economic-Trend Assumptions in Medium- and Long-Range Actuarial Cost Estimates for Pension Systems," reprint from *Actas de La III Conference Internacional de Actuaries y Estadigrafos de la Seguridad Social, Madrid,* November 1962.

"real" income, it is important to look at social insurance projections based on these more realistic assumptions.

The staff of the Joint Economic Committee of Congress has recently released a long-range projection entitled, *U.S. Economic Growth to 1975: Potentials and Problems.* This study projects contributions for social insurance under scheduled rate changes but on assumptions of increasing money and real wage levels. It also projects social insurance benefits on the basis of estimates of broadened programs that will affect future payments. These projections suggest a 160-percent increase in the amount of OASI contributions from 1965 to 1975, while gross national product is expected to increase by 77 percent. OASI contributions would go from 2.6 percent or GNP in 1965 to 3.7 percent of GNP in 1975. (See table 5.)

The projections are based on existing programs or programs just adopted. The figures for 1975 could be much larger if average benefit levels were substantially liberalized.[7]

TABLE 5.—JOINT ECONOMIC COMMITTEE STAFF PROJECTIONS OF GNP, SOCIAL INSURANCE CONTRIBUTIONS AND BENEFITS, AND TOTAL GOVERNMENT RECEIPTS AND EXPENDITURES

1965 ACTUAL AND 1975 PROJECTED

	Amount in billions		Percent of GNP	
	1965	1975 [1]	1965	1975 [1]
GNP	$681.2	$1,205.0	----------	----------
Personal income	535.1	961.8	----------	----------
Contributions for social insurance [2]	29.2	66.0	4.3	5.5
OASI	17.4	45.0	2.6	3.7
Unemployment insurance	3.8	6.8	.6	.6
Other	8.0	14.5	1.2	1.2
Government transfer payments to persons	37.1	79.5	5.4	6.6
OASI	18.1	42.7	2.7	3.5
Unemployment insurance	2.3	4.4	.3	.4
Other [3]	16.8	32.4	2.5	2.7
Total Government receipts and expenditures:				
Federal Government:				
Receipts under 1965 tax law	124.9	246.9	18.3	20.5
Expenditures [4]	123.4	203.1	18.2	16.9
Surplus or deficit (−)	1.6	43.8	(5)	3.6
State and local governments:				
Receipts (less Federal grants-in-aid)	64.1	131.0	9.4	10.9
Expenditures (less Federal grants-in-aid)	62.5	130.6	9.2	10.8
Surplus or deficit (−)	1.6	0.4	(5)	(5)

[1] Price level for GNP assumed to rise at 1.5 percent per year. Average annual gain in real output per man-hour was assumed to be 3 percent. Unemployment was assumed to be 4 percent of labor force (projection B).
[2] Under existing legislation with adjustments for scheduled changes in tax rates and wage base.
[3] Expenditures under new programs in present legislation extrapolated in part on a judgmental basis. (See source, p. 21.)
[4] Assumes some reduction in defense expenditures after 1967, and an increase in Federal grants-in-aid from $11,200,000,000 in 1965 to $25,000,000,000 in 1975.
[5] Less than 0.05 percent.

Source: "U.S. Economic Growth to 1975: Potentials and Problems" study prepared for the Subcommittee on Economic Progress, Joint Economic Committee, 89th Cong., 2d sess., 1966, pp. 21, 24, 27.

These projections indicate that social insurance programs will continue to rise relative to national income and product. However, the

[7] Cost and benefit estimates on increasing earning assumptions were included in *The 1966 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds,* Feb. 28, 1966, pp. 39–40. These estimates showed slightly lower level of contributions and benefits for 1975 than the Joint Economic Committee staff study.

rise will essentially be due to new and expanded programs rather than to growth in the numbers of aged relative to the total or the working population.

LIMITS TO PAYROLL TAX FINANCING

The history and scheduled increases in the social security payroll tax are shown in table 2 (p. 30). Under existing law the combined employer and employee tax rate is scheduled to reach 9.8 percent of taxable wages up to $6,600 in 1969. Under the bill, reported by the House Committee on Ways and Means in August 1967 (H.R. 12080), the rate would reach 9.6 percent of $7,600. The scheduled rate in H.R. 12080 will exceed 11 percent of taxable wages by 1973.

The maximum tax for an employee in 1968 would be increased from $290.40 under present law to $334.40 under H.R. 12080. The maximum combined tax on employer and employee would increase from $580.80 to $668.80.

These are heavy taxes on an income of $6,600 or even $7,600. By way of comparison, a family with two children and income of $5,000 in 1967 would pay a Federal income tax of $306 (assuming standard deductions). At lower income levels the social security tax for most families would exceed the income tax. If the family had more than one wage earner, its direct payroll tax would substantially exceed its income tax.

The employee also bears some part of the employer's portion of the tax whether the tax is assumed to be shifted forward in the prices of goods and services or to be shifted backward in the form of lower money wages.[8]

That the payroll tax is reaching very burdensome levels was brought home to many people in 1966 when the maximum tax, as a result of a combined rate and base increase, went up by $103 for the employee alone—an increase of 59 percent in 1 year. The reaction of organized labor was shown in a recent publication of the AFL–CIO:[9]

> Clearly, the point is nearing when it will be difficult to tax low-paid workers at much higher rates. This creates a dilemma. Sooner or later, the principle that payroll taxes shall be the sole source of funding should be modified or goals must be lowered to the less than adequate improvements that can be financed this way.

A combined payroll tax rate approaching 10 percent of taxable wages is likely to have significant effects on business decisions. A 10-percent tax on additional labor (at least that involving the hiring of new employees) could well tip the balance in favor of decisions to invest further in laborsaving equipment.[10] Moreover, the payroll tax is a relatively heavy tax on lower paid, less skilled labor. The impact may be significant on industries which rely more than the average on such labor. A tax impact which discourages the hiring of unskilled workers goes in the opposite direction to Government policies and pro-

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[8] There is also the possibility that a portion of the tax may be shifted to profits and rents.

[9] Bert Seidman, "The Case for Higher Social Security Benefits," reprinted from the AFL–CIO *Federationist*, January 1967.

[10] For further analysis, see Tax Foundation, *Economic Aspects of the Social Security Tax* (New York, 1966), ch. III.

grams which are designed to relieve the relatively high unemployment rates among unskilled groups.

It is true that other taxes also have undesirable effects, but those of a payroll tax of 10 percent or more of wages up to a limited amount in most respects seem likely to be more significant than those of income taxes.[11]

The level of the payroll tax may be limited by another type of consideration. It would not be reasonable, in the view of many people, to levy social security payroll taxes at a rate in excess of what similar benefits would cost if the employee were able to provide them through private forms of saving and insurance.

The payroll tax has now risen to a level such that, on the basis of certain assumptions, the total value (including interest) of *employee* taxes paid over a lifetime on the wages of some people now entering the labor force will exceed the discounted value of benefits to be received by these "new entrants." For example, a calculation by Mr. Ray Peterson, formerly vice president of the Equitable Life Assurance Society of the United States, shows that the total value of employee taxes paid (under the Social Security Act as amended through 1965) by a *single male* retiring in the year 2010 would exceed his retirement benefits by 65 percent.[12]

A calculation by the Chief Actuary of the Social Security Administration shows that the average new entrant into the labor force today would just about pay for his retirement benefits from his own contributions.[13] (The contributions-benefit ratio varies substantially with family status, age of entry into the labor force, age of retirement, and other factors.)

For workers who earn at least the maximum taxable wages, a further increase in the payroll tax could substantially exceed such a limit, because benefits are heavily weighed in favor of those with lower earnings.

It has been argued that a substantial portion of the employer's tax is shifted back to the worker in the form of lower money wages and should, consequently, be taken into account in such comparisons of taxes and benefits.[14] On the other hand, it is argued that, regardless of the incidence of the tax, the employer's portion is a general contribution on behalf of all covered workers and cannot be attributed directly to the employee on whose wages the tax is levied.

The individual employee is likely to be mainly concerned with the size of his own contribution, changes in which have a direct impact on his take-home pay. From a broader economic point of view, the value of resources diverted to social insurance should be compared with their potential value in private uses. Potential private uses may include not only private personal saving, but also private pension plans largely financed by employer contributions. If the principle of "in-

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[11] For a discussion of effects, see Elizabeth Deran, "Some Economic Effects of High Taxes for Social Insurance," paper prepared for the Joint Economic Committee Compendium on Old-Age Income Assurance, 1967.

[12] Tax Foundation, *Economic Analysis of the Social Security Tax* (New York, 1966), p. 48.

[13] Robert J. Myers, "Analysis of Whether the Young Worker Receives His Money's Worth Under Social Security," mimeographed memorandum, Social Security Administration, Mar. 8, 1967. More detailed calculations can be found in *Studies on the Relationship of Contributions to Benefits in Old-Age Benefit Awards,* Social Security Administration Actuarial Note No. 20, June 1965.

[14] James M. Buchanan and Colin D. Campbell, "Voluntary Social Security," *Wall Street Journal,* Dec. 20, 1966.

dividual equity" is judged to be of primary importance in social insurance, then employer contributions can hardly be omitted entirely from comparisons of individual tax-benefit ratios.

In summary, the expansion of social insurance programs in the United States is pushing the payroll tax to discernible limits. Views on these limits depend in part on judgments concerning the relative importance of insurance elements versus the objective of "social adequacy." The scale on which both these objectives are being pursued is emphasizing the conflicts between them and the need for reexamining the major policy alternatives.

III. Financing Principles in Social Insurance

In a short space it is impossible to do justice to the extended analyses and debates that have raged over the financing of social insurance programs.[1] Nevertheless, some review of how we got where we are in 1967 is necessary to an analysis of current policy alternatives.

SHIFTS IN FINANCING PRINCIPLES FOR OASDI

The reports of several advisory groups on social security programs constitute a record of the "mainstream" of thought on social security financing. The first of these groups, the Committee on Economic Security, provided the initial recommendations for present programs in 1935. Its history, activities and views, have been reviewed by its executive director, Edwin E. Witte, in *The Development of the Social Security Act* (Madison, University of Wisconsin, 1962).

This committee based its recommendations for old-age insurance in part on two general financing principles, one of which was not adopted in the original act, and another which was subsequently sharply modified. Its recommendation for a general revenue contribution to the trust fund in addition to payroll taxes was not adopted. The principle of accumulation of a substantial reserve to meet future liabilities was very much modified by later amendments.[2]

The 1939 amendments included substantial changes in benefits and contributions. The scheduled increase in the tax rates in 1940 was postponed, so that the accumulation of reserves was on a much smaller scale than contemplated earlier. The relationship between individual contributions and benefits was also weakened.

In the 1939 amendments, "proponents of a pay-as-you-go financing won a victory but the extent of the victory was uncertain."[3] As shown in chart 2, contributions continued to exceed expenditures and the assets of the fund grew rapidly.

Few substantive changes were made in social security financing during the 1940's. Scheduled rate increases were further postponed, reducing the rate of accumulation of assets. The Revenue Act of 1943 made provision for general revenue contribution whenever it might

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[1] For a summary of the controversies over accumulating a reserve, see John J. Carroll, *Alternative Methods of Financing Old-Age, Survivors, and Disability Insurance* (Ann Arbor: University of Michigan, Institute of Public Administration, 1960), ch. III.

[2] The extent to which the committee and the original Social Security Act embraced a reserve financing principle was obscured in part by attempts to deal with problems of constitutionality (Witte, *op. cit.*, pp. 146–149). In the Ways and Means Committee report on the social security bill, old-age benefits were projected at $2.2 billion for 1965 and reserves at $30 billion (H. Rept. 615, 74th Cong., 1st sess., Apr. 5, 1965, p. 6) thus indicating a substantial reliance on the reserve principle.

[3] Carroll, *op. cit.*, p. 4.

be required, but this provision was removed in 1950 without ever being used.

The postponement of scheduled rate increases meant not only that the assets of the fund grew more slowly, but also that the existing tax rates were far less than would be necessary on an individual contributory basis, or an individual actuarial rate basis, to provide for the cost of benefits to individuals covered by the system. An individual actuarial rate has been defined as a rate "sufficiently high to cover the full cost of benefits for a person who pays it for his full working lifetime" [4] taking account of interest. Such an actuarial rate basis would primarily reflect the "individual equity" principle, as contrasted with the principle of "social adequacy":

> Individual equity means that the contributor receives benefit protection directly related to the amount of his contributions—or, in other words, actuarially equivalent thereto. Social adequacy means that the benefits paid will provide for all contributors a certain standard of living. The two concepts are thus generally in direct conflict, and social security systems usually have a benefit basis falling between complete individual equity and complete social adequacy.[5]

The late 1940's appear to have been the last time that the individual equity principle was specifically considered in planning social security amendments. The 1948 report of the Advisory Council on Social Security put considerable emphasis on this principle:

> The Council favors as the foundation of the social security system the method of contributory social insurance with benefits related to prior earnings and awarded without a means test. Differential benefits based on a work record are a reward for productive effort and are consistent with general economic incentives, while the knowledge that benefits will be paid—irrespective of whether the individual is in need—supports and stimulates his drive to add his personal savings to the basic security he has acquired through the insurance system. Under such a social insurance system, the individual earns a right to a benefit that is related to his contribution to production.[6]

The 1948 report also repeated the recommendation for a general revenue contribution:

> The Council believes that old-age and survivors insurance should be planned on the assumption that general taxation will eventually share more or less equally with employer and employee contributions in financing future benefit outlays and administrative costs. Under our recommendations, a full rate of benefits will be paid to those who retire during the first two or three decades of operation even though they pay only a fraction of the cost of their benefits. In a social insur-

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[4] *Ibid.*, p. 29.
[5] Robert J. Myers, *Social Insurance and Allied Government Programs* (Homewood, Ill.: Richard D. Irwin, Inc., 1965), p. 6.
[6] Advisory Council on Social Security to the Senate Committee on Finance, *Recommendations for Social Security Legislation* (S. Doc. 208, 80th Cong., 2d sess., Washington, D.C.: 1949), p. 1.

> ance system, it would be inequitable to ask either employers or employees to finance the entire cost of liabilities arising primarily because the act had not been passed earlier than it was. Hence, it is desirable for the Federal Government, as sponsor of the program, to assume at least part of these accrued liabilities based on the prior service of early retirants. * * * Such a contribution is particularly appropriate in view of the relief of the general taxpayer which would result from the substitution of social insurance for part of public assistance.[7]

Congress, however, rejected the recommendation for a general revenue contribution.

The 1950 amendments substantially liberalized benefits and increased the taxable wage base, as well as providing a new schedule of future increases in payroll tax rates. Extensions of coverage and liberalizations of benefits further weakened the relation between contributions and benefits. Substantial increases were provided for those already receiving retirement benefits. In general, benefits were to be computed on recent postwar levels of earnings, regardless of the fact that the individual's lifetime contribution reflected in part the much lower levels of pre-World War II wages and salaries. Inflation almost inevitably forced a shift in emphasis to "social adequacy" for older workers and those already retired.

The Social Security Act Amendments of 1956 empowered the Secretary of Health, Education, and Welfare to appoint periodically an Advisory Council on Social Security to review existing law and programs. The first Advisory Council was appointed in 1957 and made its report on January 1, 1959. The second Advisory Council was appointed in 1963 and made its report on January 1, 1965.

The reports of these two advisory councils marked a change in emphasis in financing methods. Both councils emphasized their belief in the principle of "self-support," in other words, continued payroll financing without a general revenue contribution. Both also emphasized a belief in the "current principles" of the system. However, the content, wording, and emphasis of the recommendations indicated a substantial change from the report of the Advisory Council of 1948.

One change was a virtual acceptance of the principle of pay-as-you-go financing. While this shift was not stated outright in the texts, the recommendation on the role of the trust funds in the 1959 report was as follows:

> The Council approves of the accumulation of funds that are more than sufficient to meet all foreseeable short-range contingencies, and that will therefore earn interest in somewhat larger amounts than would be earned if the funds served only a contingency purpose. The Council concludes, however, that a "full" reserve is unnecessary and does not believe that interest earnings should be expected to meet a major part of the long-range benefit costs.[8]

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[7] *Ibid.*, p. 13.

[8] The 1959 *Report of the Advisory Council on Social Security Financing*, reprinted in William Haber and Wilbur J. Cohen, *Social Security, Programs, Problems, and Policies, Selected Readings* (Homewood, Ill.: Richard D. Irwin, Inc., 1960), pp. 149.

The Council expressed the belief that "the trust funds are and will continue to be larger than would be required for contingency purposes alone."

The 1965 report of the Advisory Council on Social Security recommended that:

> The contribution rates now scheduled in the law should be adjusted to avoid the rapid increase in trust fund assets that will otherwise begin with the rate increases schedule for 1966 and 1968.[9]

The virtual acceptance of pay-as-you-go and changes in the benefit structure marked a further departure from the individual equity principle in social security financing. The relation between the individual equity principle and pay-as-you-go financing is not a simple one. It is possible to have a social insurance system related to "individual equity" with or without the accumulation of a reserve fund. However, when the advisory councils "reaffirmed" the principle of self-support (in that payroll taxes should provide sufficient revenue in the long run, with little accumulation of reserve funds, to meet benefit payments and administrative costs), they failed to spell out the implications for the individual.

There were critics and students of the social security system who did emphasize these implications. Robert M. Clark, who made a detailed study of the British and American social security systems for the Government of Canada, noted in 1959 that:

> The critical test of the actuarial soundness of the [OASI] program is * * * yet to come * * *. This is readily apparent from the fact that by 1969 the tax rates for [OASI] will have to be raised from the combined rate * * * of 4 percent in 1958 to 8½ percent * * *. Sooner or later voices are likely to be raised in the Congress saying that the burden of contributions for the program is becoming too heavy for a significant fraction of the self-employed, or for the lower income groups. Some will demand a subsidy from general revenues, others a change in the tax structure to reduce the burden on those with relatively low incomes.[10]

The implications were further developed by Mr. Ray Peterson in a paper for the Society of Actuaries in 1959.[11]

The questions involved here are difficult ones which have not really been subjected to sufficient economic and actuarial analysis appropriate to a wealthy and growing economy with substantially full employment. Certain problems of individual equity in a pay-as-you-go social insurance system are examined in the appendix. These problems are reflected in the concept of "actuarial soundness."

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[9] *The Status of the Social Security Program and Recommendations for Its Improvement* (Washington, D.C.: 1965), p. 18.

[10] *Economic Security for the Aged in the United States and Canada*, a report prepared for the Government of Canada (Ottawa: Queen's Printer, 1960), vol. I, p. 155.

[11] "Misconceptions and Missing Perceptions of Our Social Security System (Actuarial Anesthesia)." *Transactions of the Society of Actuaries*, vol. II, meeting No. 31, November 1959, pp. 812–919.

THE CONCEPT OF "ACTUARIAL SOUNDNESS"

As the social security system has developed in the United States, the concept of "actuarial soundness" used by the Social Security Administration has been reduced to the single question of whether expected revenues from contributions and interest will be sufficient to meet expected benefit payments and adminstrative costs. To quote one description by the Division of the Actuary:[12]

> The concept of actuarial soundness as applied to the OASI program differs to a considerable extent from this concept as it is applied to private insurance. Certain points of similarity exist, especially in comparison with private pension plans. The most important difference arises because OASI can be assumed to be perpetual in nature, with a continuing flow of new entrants resulting from the compulsory nature of the program.
>
> Accordingly, it may be said that the OASI system is actuarially sound if * * * future contribution income plus future interest receipts will support the outgo for benefits and administrative expenses over the long run. * * *

This aggregative concept might more accurately be called a concept of fiscal control. This is because the main effect of the principle is to insure that revenues will be forthcoming to meet expected benefits. The principle does not insure that individuals now entering the labor force will necessarily "get their money's worth."

An essential purpose of standards of "actuarial soundness" is to insure that funds will be available to meet claims and benefits. This purpose may be consistent with various contribution schemes and financing methods. In private individual insurance, the relation between an individual's contributions and his expected benefits is necessarily an important element in "ratemaking," the equivalent of contribution schedules in social insurance.

The declining importance of the individual equity principle in OASDI is reflected in the infrequent use of the "actuarial rate" in discussions of the cost of social insurance. On the basis of private individual insurance, "* * * the actuarial rate expresses the value of the benefits to the individual."[13] With the weighted benefit schedule of the OASDI system, such an actuarial rate would be a group rate:

> Low wage earners get large benefits in relation to their contributions than do high wage earners, and the actuarial rate represents the average value of the benefits for persons in each age group that has the opportunity to contribute over a working lifetime.[14]

Just how much redistribution from higher to lower wage earners is consistent with such a group "actuarial rate" has never been specified. The differentials in contribution-benefit ratios vary not only with earnings levels but also with marital status, retirement age,

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[12] *The Financial Principle of Self-Support in the Old-Age and Survivors Insurance System*, Social Security Administration Actuarial Study No. 40 (Washington, D.C.: 1955), p. 8.
[13] Robert M. Ball, "What Contribution Rate for Old-Age and Survivors Insurance?" *Social Security Bulletin*, July 1949, p. 4.
[14] *Ibid.*

and other factors. Nevertheless, the expected (discounted) value of a typical individual's benefits or "protection" could hardly be allowed to fall below the value of the individual's own contributions without causing legitimate protests on equity grounds. Moreover, if the whole social insurance system is to be justified substantially as a wage-related, contributory system, a similar limit must apply in some degree to the employer's contribution.

This review of financing principles indicates that the principle or "individual equity" in OASDI programs needs detailed re-examination.

IV. Major Alternatives in Financing Social Insurance

The conflict between the objectives of "social adequacy" and "individual equity" were notably illustrated in 1967. The Administration's proposed social security amendments (contained in H.R. 5710) were designed largely to make the OASDI programs a more effective instrument in the "war on poverty."

The President's message on older Americans (January 23, 1967) said:

> Although social security benefits keep 5½ million aged persons above the poverty line, more than 5 million still live in poverty.
>
> A great nation cannot tolerate these conditions. I propose social security legislation which will bring the greatest improvement in living standards for the elderly since the act was passed in 1935.

The adequacy objective was reflected in the large increase in the maximum tax base (which raises the tax relatively more than benefits for those with earnings near or above the maximum), in the increase in minimum old-age retirement benefits from $44 to $70 per month, in the special provisions for those with 25 years or more of coverage, and in other provisions. The proposed 60-percent increase in the minimum old-age retirement benefit was intended particularly to provide more adequate benefits to low-paid and irregularly employed workers, whose contributions, even under the proposed increases in tax rates and the maximum tax base, would by no means provide for such benefits. "Every insured worker retiring at or after age 65 would be paid at least $70, regardless of how long he worked under the program." [1]

The concern of the House Ways and Means Committee with maintaining a wage-related system was evident in the questioning of administrative officials and elsewhere.[2] In answering questions on the proposed minimum old-age benefit before the committee, W. J. Cohen, Under Secretary of the Department of HEW, admitted that

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[1] U.S. House of Representatives, Committee on Ways and Means, *Section-by-Section Analysis and Explanation of Provisions of H.R. 5710, the "Social Security Amendments of 1967"* as introduced on Feb. 20, 1967 (prepared and furnished by the Department of Health, Education, and Welfare), committee print, 90th Cong., 1st sess., p. 22.

[2] In a letter to the *New York Times*, dated Aug. 9, 1967, Representative Barber B. Conable, Jr. (R., N.Y.), a member of the House Ways and Means Committee, said: "Social security has had wide acceptance and strong support because through it a man can invest in his retirement, rather than simply suffer another form of taxation * * *. Social security must remain a substantially wage-related supplement if it is to continue as a valuable and widely supported aid to the working man. * * * (*New York Times*, Aug. 14, 1967).

"* * * perhaps there is some modification in policy that is embodied in this proposal. We think the system should be consistent with the philosophy of a wage-related system and still make a substantial contribution to the reduction of poverty; we think that those two objectives should be kept in mind but always balanced so that people who have higher earnings and who contribute more get more." [3]

The concern of the Ways and Means Committee was evident also in the sharp cut backs in proposed increases in benefits and payroll taxes in the bill (H.R. 12080) reported by the committee on August 7, 1967 (see(table 1, above, p. 22).

Recent debates and current pressures for change suggest various alternatives or possibilities for the future financing of OASDI programs.[4] Four alternatives, illustrating the major value judgments and economic issues involved, are examined here: (1) To continue approximately the present balance between the objectives of social adequacy and individual equity; (2) to provide a general revenue contribution to OASDI trust funds; (3) to modify the payroll tax to reduce the burden on low income groups; and (4) to divide the benefit schedules into two portions, one of which would be based on "adequacy," and one which would directly reflect individual contributions, and to finance each portion separately by different forms of taxation.

MAINTAINING THE PRESENT BALANCE OF OBJECTIVES

Through a long political process the United States has developed a social insurance system that provides a working balance between the objectives of adequacy and individual equity. Indeed, some such balance may be taken as one of the distinguishing features of "social insurance."

The Committee on Social Insurance Terminology of the American Risk and Insurance Association, in its most recent redrafting of the definition of "social insurance," listed as one of the conditions or characteristics of such insurance the following:

> The benefits for any individual are not usually directly related to contributions made by or in respect of him but instead usually redistribute income so as to favor certain groups such as those with low former wages or a large number of dependents.[5]

The extent of redistribution consistent with "social insurance," however, is largely a matter of value judgments. The current balance in objectives is being strained as the payroll tax burden grows. In the view of one member of the House Committee on Ways and Means, a substantial increase in the redistribution of income in favor of low income groups under social insurance programs: "* * * would remake our social security system into an extension of the welfare pro-

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[3] Quoted in American Enterprise Institute, *Legislative Analysis, Proposed Social Security Amendments of 1967* (Washington, D.C.: 1967), pp. 25, 26.

[4] Hospital insurance and the voluntary medical supplementary insurance, adopted in 1965, are not separately examined here. They involve another range of issues in addition to the fundamental issues of objectives in the older "insurance" programs. The innovations in financing health insurance, including a general revenue contribution for SMI, nevertheless serve to illustrate problems in financing the older programs.

[5] Unpublished mimeographed draft dated spring 1967.

grams. We would then be in the position of requiring greater contributions for welfare from the wage earner than from the general taxpayer." [6]

It is also argued that the present financing system, relying only on payroll taxes, provides a restraint on expenditures that would be removed by a shift to general revenue financing. Representative Wilbur D. Mills, chairman of the House Ways and Means Committee, once said:

> I do not believe there should ultimately be a contribution from general revenues. If there is such a contribution, there is no real deterrent to demand for extremely high payments.[7]

The present system of payroll tax financing contains an important fiscal control device. Whenever increase benefits are proposed, the House Ways and Means Committee, under whose jurisdiction social security falls, must also consider the long-range financing of such benefits as well as administrative costs. When the benefits schedule is revised, the contributions schedule is also revised to insure that sufficient revenues will be forthcoming to meet all benefits and other costs. This is a device that does not operate in the general budget, although similar procedures have been proposed for administrative budget programs.

The effect of this fiscal control device on the level of expenditures in the past may be questioned. Other countries have social insurance systems in which the same type of fiscal procedure operates, except that a general revenue contribution is a part of the additional levy that goes with increased benefits. A recent study comparing social insurance systems in different countries shows that partial reliance on general revenues in social insurance systems is not associated with higher expenditures: "* * * the proportion of national income devoted to social security is higher in some of the countries that rely less on general revenues for financing these expenditures." [8]

Over the last two decades in the United States, the tendency of social security benefit increases to be associated with election years suggests that the benefit increases have been of more concern to the public than the payroll tax increases. Until recently the payroll tax was relatively small, and people appear to have had an exaggerated idea of the extent to which they were paying for their own benefits. After surveying the opinions of various groups in the United States, Robert M. Clark concluded:

> Most Americans are enthusiastically in favor of old-age, survivors, and disability insurance. They feel that this is their program and not something the Government does for them * * * most people have a highly exaggerated idea of the extent to which they have or will have paid for their benefits.[9]

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[6] Representative Barber B. Conable, Jr., *New York Times*, Aug. 14, 1967.
[7] Statement in an interview quoted by Robert M. Clark, *Economic Security for the Aged in the United States and Canada*, a report prepared for the Government of Canada (Ottawa: Queen's Printer, 1960), vol. I, p. 155.
[8] Henry Aaron, "Social Security: International Comparisons," in Otto Eckstein, ed., *Studies in the Economics of Income Maintenance*, Washington, D.C. The Brookings Institution, 1967, p. 20.
[9] *Op. cit.*, p. 179.

The small extent to which benefits have been prepaid is shown in an estimate by the Chief Actuary of the Social Security Administration:

> For those now on the rolls (1964), it is likely that they would have paid, at most, for about 10 percent of the benefits actually payable to them.[10]

As indicated in section II, the tax-benefit ratios have changed drastically for new entrants to the labor force. The ratio of the value of the employee's tax payments to the expected value of the benefit under existing legislation would be nearly tenfold greater for persons retiring in 2010 than for those retiring in 1965.[11] If people have had illusions in the past about the degree to which they were paying for their own social security, these illusions are likely to be dispelled in the future. The impact of payroll taxes at current and prospective levels will almost certainly generate opposition to increased social security benefits.

Maintaining approximately the existing balance of objectives in OASDI programs will be difficult in the future even if that balance is deemed desirable.

PROVIDING A GENERAL REVENUE CONTRIBUTION

The objective of more adequate benefits was clearly a part of the proposed general revenue contribution in the social security bill (S. 3661) introduced in 1966 by Senator Robert Kennedy. In introducing this bill, he said:

> * * * in 1964, two out of five aged couples in this country had incomes of less than $3,000. One out of four had income of less than $2,000.
>
> For these elderly people, social security has still not lived up to its original promise to avert economic insecurity in retirement. We must now keep that promise. We must now provide adequate benefits, and we can do so with fiscal soundness to all who are insured. We must explore the full potential of the social security system to serve as a guarantor of the retired years of our people.[12]

In addition to emphasizing adequacy, some proponents of a general revenue contribution argue not only that the payroll tax is high, but that this is a poor way to finance increases in benefits. If the OASDI system is to be made more of an instrument for preventing or removing poverty, it would hardly be fair to do so with a tax that reaches a maximum at $6,600 or $7,600. An increased emphasis on social adequacy would more logically be accomplished through tax burdens based on ability to pay.

On the benefits side, it is argued by others that a general increase in social insurance benefits would be an expensive way to reduce poverty because benefits would also be increased for those well above the pov-

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[10] Statement quoted in American Enterprise Institute, *Legislative Analysis, Proposed Social Security Amendments of 1967* (Washington, D.C.: 1967), p. 41.

[11] Tax Foundation, *Economic Aspects of the Social Security Tax* (New York, 1966), p. 48. Comparisons were based on an interest rate of 3½ percent, and assumed that the individuals earned the maximum taxable wage or more.

[12] *Congressional Record—Senate*, vol. 112, No. 122, July 28, 1966, p. 16605.

erty line at the same time. If the prime objective is to improve the economic position of those below the poverty line, a dollar of expenditures will go further in other programs than through increases in the social insurance benefit structure.[13]

Historically, a more technical argument has been used for a general revenue contribution. It is that in the transitional stage to a mature social insurance system, most people become eligible for benefits even though they have not contributed anything like the full cost of those benefits. Until most workers have contributed a lifetime at rates commensurate with the benefits they will receive, a large windfall will continue to accrue to current beneficiaries. This windfall, it is argued, constitutes an unfunded liability the burden of which should be borne by all taxpayers through general revenues rather than through the payroll tax. Since the use of the payroll tax is largely justified by the *quid pro quo* element, the redistribution in favor of current beneficiaries receiving windfalls should be met by a general levy.

This position has been countered by the argument that under the present system, the employer's contribution is really a contribution on behalf of all workers and cannot be attributed to the particular individuals on whose wages the tax was levied. Thus the employer's contributions may be used for redistributive purposes to whatever extent one may deem such redistribution to be consistent with social insurance. In particular, the employer's contribution may be considered an appropriate way to finance the windfalls accruing to current beneficiaries during the process of approaching a mature social insurance system.

The social insurance system, as it has operated to date, will never in fact reach maturity because the benefit structure will continue to be revised upward at least to take account of increased prices and probably also to provide the aged with improved real incomes as the Nation's average standard of living rises. Because Congress will almost certainly take account of these dynamic elements on the benefits side, it would be more realistic to take account of such changes in determining the allocation of the related taxes in the long run.

MODIFYING THE PAYROLL TAX

Closely related to a general revenue contribution is the proposal to modify the payroll tax to make it more like an income tax: to allow personal exemptions and to increase substantially the maximum wage base. Such changes would check the growing impact of direct taxes on low-income groups that goes with increased reliance on the payroll tax.[14]

It is argued that "* * * the distinction between the personal income tax and the social security tax, *qua* taxes, is almost completely arbitrary," [15] and so the impact of the two taxes should be examined as a unit. Such a viewpoint would, in effect, mean giving up the contributory principle as the primary justification of the payroll tax.

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[13] Christopher Green, *Negative Taxes and the Poverty Problem* (Washington, D.C.: The Brookings Institution, 1967), pp. 41–43.

[14] Henry Aaron, "Rate Progressivity and the Direct Taxation of Personal Income," *Taxes, the Tax Magazine*, vol. 44, No. 7, July 1966, pp. 497–503; Joseph M. Bonin, "OASDHI Taxation and the Progressivity of the Federal Tax Structure," *Taxes, the Tax Magazine*, vol. 45, No. 2, February 1967, pp. 137–140.

[15] *Ibid.*, p. 498.

A high maximum wage base would also mean increased benefit levels. With the present type of benefit structure, which is heavily weighted in favor of those low earnings records, a higher maximum base would also serve to increase the emphasis on adequacy.[16]

Even more than a general revenue contribution, the alternative of modifying the payroll tax would reflect the social adequacy objective and mean almost complete departure from the principle of relating an individual's contributions to his benefits.

SEPARATING WELFARE AND INSURANCE ELEMENTS

The conflict between the objectives of social adequacy and individual equity suggests the possibility of separating the major elements in OASDI programs designed to meet these different objectives.

These portions of the programs may also be called the welfare and insurance elements. In the broadest terms, the welfare element may be defined as that part of benefits which is determined largely on the basis of adequacy. Thus, the minimum old-age benefits bear no relation to the average covered wages of the beneficiary except that these wages must be low and the beneficiary must have a record of some covered employment.

The insurance element, on the other hand, would consist of that part of benefits which, is, or can be, related to average covered wages. This relation would not be the strict relation between individual premiums and value of benefits in private individual insurance; it would necessarily be a looser relationship more characteristic of private group insurance and group annuities. Moreover, many of the variations in risks that may be taken into account in private insurance might not be appropriate for a social insurance program—such as differences in length of life characteristic of different races or income groups or areas.

In group insurance, "equity requires that, within the bounds of practicality, each group pay a premium which reflects its expectation of loss." [17] State regulation usually provides that * * * the benefits provided under a policy must be reasonable in relation to the premium charged." [18]

Isolating an insurance element in OASDI programs raises fundamental questions of whether there are insurable risks that are unlikely to be met by private enterprise and private saving, and for which compulsory coverage by a governmental system may be justified. Because of the overlay of the social adequacy objective in the past, these issues have not received the detailed analysis that would be appropriate if the emphasis in social insurance were to be shifted toward the individual equity principle.

A separation of insurance elements would mean greater reliance on the benefit principle of taxation. The economic argument here is that

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[16] "* * * under the cash-benefits portion of the OASDHI system, the basic benefit amount (payable to a worker retiring at age 65 * * *) is $107 a month for a person earning $275 a month, whereas it is $168 a month for a person at the maximum creditable earnings of $550 a month. Thus, although the latter individual contributes twice as much as the former individual, his benefit rate is only 57 percent higher." (Robert J. Myers, "Employee Social Insurance Contributions and Progressive Taxation," to be published in the *Journal of Risk and Insurance.*)

[17] Morton D. Miller, "Manual Rate Making in Group Life Insurance," in *Group Insurance Handbook* (Homewood, Ill.: Richard D. Irwin, Inc., 1967), p. 184.

[18] *Ibid.*

where the benefits of public expenditures can be attributed to specific groups of individuals, and taxes for the support of these expenditures can be efficiently levied on these same groups, people will, on the whole, be better off than if these expenditures are financed out of general revenues.

With annual expenditures of approximately $20 billion for social insurance, the potential for more economic and equitable allocation of these resources is large.

V. Possibilities and Problems in a Two-Tier System

The conflict between the objectives of social adequacy and individual equity suggests the possibility of separating the major elements in OASDI programs designed to meet these different objectives, and to provide different kinds of financing for each.

At least in a formal sense, we now have "separate" systems for old-age and survivors insurance, disability insurance, hospital insurance, and supplementary medical insurance (SMI). Each is assigned a designated part of the tax rate (except for the optional "premium" in the case of SMI), and each is assigned a separate trust fund. For supplementary medical insurance, the Government makes a contribution from general revenues equal to the total premiums of participants.

It would be feasible to go to a system in which minimum retirement benefits, for example (or other noninsurance portions of benefits, were financed from, say, a specified rate on individual *taxable* income (as defined for income tax purposes). Insurance elements would continue to be financed by payroll taxes. A system on such lines is now being used in Canada.

THE CANADIAN SYSTEM

In 1952 the Government of Canada adopted a universal old-age pension of a flat amount per person, paid without a means test, and financed by a three-way tax on individual incomes, corporation incomes, and manufacturers sales. (The manufacturers sales tax is an important part of the Federal tax system in Canada.) The three-way tax was originally a 2-percent (now 4-percent) surcharge levied on the base of these three major Federal taxes. The pension was originally $40 per month. It is now $75 per month.

In 1965 Canada adopted, in addition to this universal old-age pension, a wage-related contributory system, called the Canada pension plan, under which individual contributions are closely related to benefits.[1]

The Canada pension plan provides retirement pensions, disability pensions, children's, wives', and widows' benefits in case of death or disability, and a lump-sum payment at death. Benefits are to be adjusted in accordance with the cost of living (and eventually related to the average wage level).

[1] Further details can be found in *The Canada Pension Plan* (Ottawa: The Queen's Printer: 1965).

The plan is financed by "contributions" from the employer, the employee, and the self-employed. Currently the employer and the employee each pay a tax of 1.8 percent on taxable earnings up to $5,000, with a $600 exemption. The self-employed pay a tax of 3.6 percent on earnings from $600 to $5,000. The contributions are deductible for income tax purposes, while benefits will be taxable income when paid.

The retirement pensions eventually will amount to 25 percent of annual covered earnings up to the maximum of $5,000 with an allowance for low or nonearning years. Full retirement pensions first become available on January 1, 1976. Until that date reduced amounts of pensions will be paid to those eligible. Where both husband and wife have contributed, both are entitled to retirement pensions.

This system appears to have developed more in response to public demands for old-age security than as a fully thought-out scheme for social insurance.[2]

MEANING OF "SOCIAL INSURANCE"

If revision of the U.S. system were to be in the direction separating elements based on the individual equity principle, an essential problem would be to define more clearly the insurance elements appropriate in a compulsory governmental system.[3]

A good deal of analytical effort has gone into developing a definition of "social insurance."[4] Part of the problem of terminology is that the definition depends in some degree on judgments concerning appropriate methods of financing and the extent to which concepts of adequacy can be combined with a wage-related, contributory system. The definition is also likely to change as actual social security systems evolve.

A recently revised draft (spring 1967) of the definition of "social insurance" by the Committee on Social Insurance Terminology of the American Risk and Insurance Association reads in part as follows:

> SOCIAL INSURANCE.—A device for the pooling of risks by their transfer to an organization, usually governmental, that is required by law to provide pecuniary or service benefits to or on behalf of covered persons upon the occurrance of certain predesignated losses under *all* of the following conditions:
>
> (1) Coverage is compulsory by law in virtually all instances.
>
> (2) Eligibility for benefits is derived * * * from contributions having been made * * * by or in respect of

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[2] On the political history of the old-age pension, see A. Kenneth Eaton, *Essays in Taxation* (Toronto: Canadian Tax Foundation, 1966), pp. 132–157. On the Canada Pension Plan, see Irving J. Goffman, *Some Fiscal Aspects of Public Welfare in Canada* (Toronto: Canadian Tax Foundation, 1965), p. 100. There were precedents, however, in other countries, particularly West Germany (*Old-Age and Sickness Insurance in West Germany in 1965*, Social Security Administration Research Report No. 13, Washington, D.C.: Government Printing Office, 1965).

[3] A theoretical analysis of medical insurance relating to private nonprofit systems as well as to government can be found in Kenneth J. Arrow, "Uncertainty and the Welfare Economics of Medical Care," *American Economic Review*, vol. LIII, No. 5, December 1963, pp. 941–973.

[4] C. Arthur Williams, Jr., "Social Insurance—Proper Terminology?" *The Journal of Insurance*, vol. 30, No. 1, March 1963, pp. 112–128.

the claimant * * *; there is no requirement that the individual demonstrate inadequate financial resources, although a dependency status may need to be established.

(3) The method for determining the benefits is prescribed by law.

(4) The benefits for any individual are not usually directly related to contributions made by or in respect of him but instead usually redistribute income so as to favor certain groups such as those with low former wages or a large number of dependents.

(5) There is a definite plan for financing benefits that is designed to be adequate in terms of long-range considerations.

(6) The cost is borne primarily by contributions which are usually made by covered persons, their employers, or both.

(7) The plan is administered or at least supervised by the Government.

(8) The plan is not established by the Government solely for its present or former employees.

This definition accurately reflects the state of social insurance today, but it does not point up the current problems in social insurance financing.

JUSTIFICATION FOR WAGE-RELATED CONTRIBUTORY SYSTEM

The traditional arguments for a social *insurance* system, in addition to adequacy considerations, still have relevance.

Since the beginning of the social security system, compulsory provision for old age has been justified by the argument that without such provision many of the aged would become public charges, or direct welfare recipients. If many people voluntarily provide for their own old age while others do not, the former will end up paying part of the old age costs of the latter.

The force of this argument has diminished somewhat with the increasing private financing resources of the aged although the majority of OASDI beneficiaries still have no other source of "retirement income." [5] As income rises, providing for their own retirement becomes one of the services that more and more people want to buy. At low-income levels, the implicit discount rate that many people put on saving for old age is undoubtedly high. This is suggested by the extremely high-interest rates that many persons at low-income levels (and in low-income countries) are willing to pay for borrowing of any sort.

Forcing people to save through social insurance may appear to be an undue interference with individual choice.[6] However, the evidence seems to be that social security has had the effect in the past of height-

[5] Robert M. Ball, "Policy Issues in Social Security," *Social Security Bulletin*, June 1966, p. 5, and *The Aged Population of the United States, the 1963 Social Security Survey of the Aged*, Social Security Administration Research Report No. 19 (Washington, D.C.: Government Printing Office, 1967).

[6] The economic question of whether the individual savings in the form of social insurance taxes will actually be turned into real national saving and investment is another question which is examined below, p. 55.

ening the people's awareness of the need for saving for old age, and also has given them a start on which to build additional private saving and insurance. The fact that the initial tax rate in this country was so low (1 percent) for nearly a decade and a half perhaps contributed to some illusion as to how much insurance was actually being *purchased*—as Mr. Robert Clark has indicated, people generally have an exaggerated idea of how much they have contributed to their own benefits.

In any case, far from checking the growth of private insurance, social security seems to have stimulated it.[7] Whether or not such a relation may continue is another matter—if social security taxes continue to rise, they may well limit the ability of people to save in other ways.

However, the arguments may be arrayed on the question of compulsory saving for old age, at least a minimum of such compulsion is accepted in most western countries. Acceptance of such compulsion seems to be a part of the decline of dependence on the family as an old-age security system.

The limitations of private provision for old age continue to provide a justification for a governmental system. Even though the employee might not choose to save toward his old age, some portion of the cost of a minimum old-age pension should probably be regarded as a necessary part of the cost of production of goods and services. As more than one writer on insurance economics has pointed out, we set up accounts to take care of depreciation and obsolescence of physical assets; and at least part of the cost of life insurance and retirement for individuals should be treated in a similar fashion by the firm as well as the individual.[8]

The rapid growth of group insurance and private pension plans shows a recognition in the market that the current cost of production includes some provision for the worker after he reaches an age of retirement or one in which he can no longer work productively. But, despite the growth of what has been called the corporate social security system,[9] the workings of the labor market are usually such that the individual firm is not forced to take into account the cost of maintaining workers after they retire, at least for employees who remain with one firm for a short time. To insure that such costs are taken into account in current production may be regarded as one of the economic justifications for a social insurance system.[10]

The social insurance system compels every employer as well as the employee to contribute an equal amount to OASDI. The employee remains covered, and in a sense, receives credit for his and his employer's contributions, no matter how often he changes jobs. These features of immediate "vesting" of pension and insurance rights and of "port-

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[7] Philip Cagan, *The Effect of Pension Plans on Aggregate Saving,* National Bureau of Economic Research, Occasional Paper No. 95 (New York, 1965), pp. 6, 82; and John H. Magee, *Life Insurance* (Homewood, Ill.: 1958), p. 361.

[8] S. S. Heubner, *The Economics of Life Insurance,* third edition (New York: Appleton-Century-Crofts, 1959), particularly ch. 7.

[9] Harland Fox, "The Corporate Social Security System and Workmen's Compensation," *The Conference Board Record,* vol. I, No. 2, February 1964, pp. 7–16.

[10] There are "external costs" involved in provision for old age which usually is not taken into account by the individual and the firm. In a similar way, private business accounting did not adequately take account of depreciation costs before the advent of the income tax. (George Terborgh, *Realistic Depreciation Policy,* Machinery and Allied Products Institute, Washington, D.C., 1954, pp. 2, 3.)

ability" are the very features that are difficult to provide for all employees under private insurance.

Social insurance thus provides a means of insuring that all, or nearly all, individuals and firms take account of costs of old age and disability that otherwise would fall on the general taxpayer.

One of the distinctive features of social insurance is that it provides a means of taking care of the "transitional" costs of instituting old-age income insurance without necessarily involving the long period for the buildup of reserves and the growth of investment income that are an essential part of private insurance and pension plans.

Under a pay-as-you-go system, the present labor force pays taxes which are used to support the present beneficiaries. Those who are currently paying taxes receive, in exchange, a promise by the Government (though not in the form of a contract) to provide them with certain benefits or "protection." This promise to pay can provide today's worker with "his money's worth" even though the taxes are used currently to support persons whose contributions have been far less than the cost of their benefits. The social insurance system is more than a process of redistributing income by age group (or by income level).

By relating an individual's contributions to his benefits, a mutually advantageous exchange (between people in different age groups) can be achieved,[11] while under an income redistributing system, some people necessarily give up something to provide a gain for others. By general consensus, some income redistribution is necessary in providing for the needy aged—our society does in some way take care of the destitute. But, at any level of old-age benefits, the economic position of most individuals could be improved by providing a financing system in which benefits are related to contributions, and income redistributing elements are separately financed by general revenues (or, more strictly, from the individual income tax). (The meaning of redistribution is discussed further on page 57.)

This point is closely related to the traditional argument that social insurance gave people a sense of collecting by "right" rather than as welfare recipients. If people have "paid for" social security on an individual equity basis, the payroll tax is of much less significance as a *tax* than if it is essentially being used for income redistribution.[12]

REDISTRIBUTION IN OASDI

The "welfare" element in OASDI is reflected in the substantial amount of income redistribution that is effected through these programs. The two major kinds of redistribution involved are: (1) from higher to lower income groups, and (2) from those currently working and "contributing" to those who are receiving benefits substantially in in excess of their own contributions in the past. In addition to these

[11] This and some related propositions were demonstrated by Paul A. Samuelson in his article, "An Exact Consumption-Loan Model of Interest With or Without the Social Contrivance of Money," *Journal of Political Economy,* vol. 46, No. 6, December 1958, pp. 467–482. See also the appendix below, p.63. An opposing view, that on true economic exchange can be made between generations by social insurance, can be found in Abba P. Lerner, "Consumption-Loan Interest and Money," *Journal of Political Economy,* vol. 67, No. 5, October 1959, pp. 512–525. Lerner's view, in effect, is a denial of the possibility of a *quid pro quo* financing basis in a pay-as-you-go social insurance system.

[12] For further elaboration of the benefit principle as applied to social insurance, see W. Glenn Campbell, "The Economics of Social Security and the Theory of Government Finance," *National Tax Journal,* vol. 4, No. 2, June 1951, pp. 167–179.

types of redistribution, the existing benefit structure and conditions of eligibility discriminate in favor of certain groups of people regardless of income level or age.[13]

Neither of the two major kinds of redistribution—by wage level or by age group—can be easily measured, in part because of problems of definition. Redistribution by income level can be defined with respect to the existing benefit structure and contribution levels: How do the existing or expected benefits compare with contributions under present law for people at different income levels? Studies done on this basis indicate a substantial redistribution from those whose earnings are near or above the maximum taxable level, to those whose earnings are well below the maximum.[14] Such comparisons made at any point of time must assume some expected benefit levels and past or future contribution levels, which may turn out to be unrealistic.

Redistribution by income level may also relate to the total relation between payroll taxes paid by all groups at different income levels and the benefits received by all families at different income levels.[15] This collective redistribution is useful for examining broad fiscal effects of the social insurance system. It has little direct relevance to the problems of equity because it does not distinguish between age groups by income levels and takes no account of *quid pro quo* elements.

"Intergenerational" redistribution is also subject to definitional problems. The extent to which an individual pays for his own benefits is debatable. Some would attribute to the individual not only the employee's contribution but also all or a part of the employer's contribution. Others argue that the employer's contribution cannot be attributed to the individual employee but is a general contribution for the support of all covered workers. Some would argue that even the employee's contribution has so little relation to benefits that the whole process is a transfer with no real element of payment in exchange for a service.[16]

A true, wage-related pension system would be more than a transfer—each individual would have "paid for" his pension during his working years.

The transitional problems involved in providing "adequate" benefits during the period between the initiation of the program and the time when most people will have contributed over a working lifetime constitute perhaps the most difficult problems of equity. The problems are difficult because to have a program of importance in the transitional period, benefits cannot be based solely on contributions paid. The principle of social adequacy is given an important role, and it means "windfalls" to most beneficiaries during the transition to a "mature" system.

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[13] Elizabeth Deran, "Income Redistribution Under the Social Security System," *National Tax Journal*, vol. 19, No. 3, September 1966, pp. 276–285; and Henry Aaron, "Income Transfers Under Social Security," in Otto Eckstein, ed., *Studies in the Economics of Income Maintenance* (Washington, D.C.: The Brookings Institution, 1967), pp. 61–72.

[14] Ernest C. Harvey, "Social Security Taxes—Regressive or Progressive?" *National Tax Journal*, vol. 18, No. 4, pp. 408–414.

[15] For example, Tax Foundation, *Tax Burdens and Benefits of Government Expenditures by Income Class, 1961 and 1965* (New York: 1967), pp. 32, 33.

[16] "Pension benefits are too loosely related to contributions for the annuity analogy to hold in any meaningful sense." (*Old Age Income Assurance: An Outline of Issues and Alternatives*, materials prepared by the committee staff for the Subcommittee on Fiscal Policy of the Joint Economic Committee, 89th Cong., 2d sess., Washington, D.C., Government Printing Office, 1966, p. 8.)

The question of how the costs of these windfalls are to be distributed has now been largely answered by past decisions in this country; namely, through employer's contributions and the flow of employee contributions from new entrants to the labor force. A justification for this kind of financing can be made on the same grounds as the justification for a "mature" wage-related system, as long as the transitional financing does not fall outside the limits of the principle of "individual equity."

It is argued in the appendix that the transitional problems of financing under a pay-as-you-go system can be consistent with the principle of individual equity. The implication of this conclusion is that in separating "welfare" and "insurance" elements, it is redistribution by income level for current contributors, not "intergenerational" redistribution, that is logically financed by general revenues. Intergenerational redistribution can, under reasonable assumptions, be financed by payroll taxation subject to the individual equity principle for current contributors. The "transfer" payment to current beneficiaries does not mean that current taxpayers will not "get their money's worth" in exchange for their own contributions.

COMPLEXITY

One of the considerations in a shift of emphasis to the individual equity principle would be an increase in the complexity of theoretical and administrative problems. The aggregate principle of "actuarial soundness" now being used is simple as compared with the problems of relating individual contributions to individual benefit levels.

A considerable expansion of the research programs of the Social Security Administration would probably be required. As the Chief Actuary once pointed out:

> The principle of individual equity is difficult to disagree with. The problem arises that this principle is easy to discuss in general but relatively difficult to define specifically. Certain questions arise: Should only workers who actually earn the maximum taxable wage for every year of their working life be considered, or should a probable wage-history basis be used? Should retirement be assumed to occur at the earliest possible age, or should the probability of retirement at later ages be considered? Should allowance be made for the probabilities of marriage and parenthood, or should only single men and single women be considered? * * * [17]

A detailed analysis of risks and costs would involve the Social Security Administration in more actuarial work similar to that done by private insurance companies, but with different kinds of "packages" of insurance and annuities. Some change in the treatment of single and married persons would probably be necessary, and perhaps account should be taken of the varying risks for certain categories in the population. However, many variations in risks might not be appropriate to consider in a social insurance program—where significant

[17] *The Financial Principle of Self-Support in the Old-Age and Survivors Insurance System,* Social Security Administration Actuarial Study No. 40 (Washington, D.C., 1955), p. 3.

differences in length of life are characteristic of different races or income groups or areas. Costs and benefits undoubtedly would not be as closely related as is likely under private insurance.

There is precedent for detailed cost-benefit analysis for tax purposes in the Federal highway program.[18] The problems involved in relating benefits to contributions for social insurance are probably less complicated than for highway programs. The very fact that cash payments and receipts are involved, rather than benefits that must be estimated, simplifies the problems. Social insurance is analogous to private group insurance rather than to individual life insurance, and the problems of dealing with particular age groups as a whole, rather than with individual risks, are simpler to handle.

Moreover, the proposal that individual contributions be actuarially related to benefits is not a new one. It has been explored by the Social Security Administration and by various study commissions and individual experts in the past.[19] Other countries have relied in varying degrees on a contributory, wage-related, insurance program.

WELFARE VERSUS INSURANCE COSTS

How much would a social insurance system cost if welfare elements were largely eliminated? The answer would depend in part on the extent of risks covered as well as on the definition of such elements.

One way of estimating the redistributive element by income level would be to examine OASDI benefit levels in relation to "actuarially justified" pensions. Such estimates have been made by Henry Aaron, but he did not carry them to the extent of estimating an aggregate amount of redistribution involved.[20] Nevertheless, his estimates show a benefit-contribution ratio at low-wage levels of two to three times the ratio at maximum taxable income levels.

Another way of estimating the order of magnitude of the redistributive element in social security is to assume that the aged at low-income levels are the major beneficiaries of the redistributive elements in the system. Recent estimates indicate that about one-third of OASDI beneficiaries would have income above "poverty levels" ($1,500 for single persons and $1,900 for a couple) without OASDI benefits. About 41 percent of beneficaries are kept above "poverty levels" by OASDI payments.[21]

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[18] Under the Highway Revenue Act of 1956, the Bureau of Public Roads was directed: "* * * to make available to the Congress information on the basis of which it may determine what taxes should be imposed by the United States, and in what amounts, in order to assure, insofar as practicable, an equitable distribution of the tax burden among the various classes of persons using the Federal-aid highways or otherwise deriving benefits from such highways. In order to carry out this purpose, the Secretary of Commerce, in cooperation with other Federal officers and agencies and the State highway departments, was directed to make a study and investigation of—

(1) The effects on design, construction, and maintenance of Federal-aid highways, of the use of vehicles of different dimensions, weights, and other specifications, and the frequency of occurrences of such vehicles in the traffic stream;

(2) The proportionate share of the design, construction, and maintenance costs of the Federal-aid highways attributable to each class of persons using such highways; and

(3) Any direct and indirect benefits occurring to any class, in addition to benefits from actual use of such highways." (*Supplementary Report of the Highway Cost Allocation Study*, H. Doc. 124, 89th Cong., 1st sess., Mar. 24, 1965, p. III.)

[19] Robert M. Ball, "What Contribution Rate for Old-Age and Survivors Insurance?" *Social Security Bulletin*, July 1949, pp. 3–9.

[20] "Income Transfers Under Social Security," in Otto Eckstein, ed., *Studies in the Economics of Income Maintenance* (Washington, D.C., the Brookings Institution, 1967), pp. 61–72.

[21] Ida C. Merriam, *"Social Security Benefits and Poverty,"* Research and Statistics Note No. 6, Feb. 24, 1967, table 2.

The orders of magnitude involved can also be illustrated by estimating the cost of the present minimum retirement benefit if it were financed as a separate element of the benefit structure for all retired bneficiaries. If a minimum old-age pension of $44 per month were paid to all persons currently receiving retirement benefits (11½ million in 1966) the cost would be about $500 million per month as compared with actual monthly retirement payments of about $980 million in 1966 [22] (or about $6 billion per year as compared with actual retirement payments of about $12 billion per year).

The cost would be much less if it related only to those receiving the minimum retirement benefit.[23] A flat minimum retirement benefit for all beneficiaries would be "uneconomic" in that it would apply to those not really in need. More strictly defined, a "welfare" element would be related in some way to a means test. The OASDI system, in effect, has a means test in its record of earnings. For most beneficaries, other sources of income are of minor importance.

The direction in which a separation of welfare and insurance elements leads is a complete revision of the benefit structure. The existing weighting of benefits in favor of low-income groups would be replaced by a more closely wage-related schedule of insurance benefits. The adequacy objective would be reflected instead in a noninsurance payment also dependent on the beneficiary's record of past and current earnings. The record of attachment to the labor force would become the chief distinguishing feature between OASDI payments and public assistance. The measure of "means" or needs in the OASDI system is rough, but a major function of public welfare programs to deal in detail with the variation in needs of low-income families. The OASDI payment would be a basic cash payment for purposes of public assistance programs, as is now the case, for beneficiaries of both types of programs.

ECONOMIC EFFECTS

An important policy objective in revision of the social insurance system is the minimizing of distorting economic effects. One of the limits on payroll taxes is the possible differential effects on different kinds of industries. These have been examined in a previous tax foundation study, as have the problems of relating social security financing to countercyclical fiscal policy.[24]

One of the major problems that bears on social security revision is the effect on economic growth. This question has been debated and examined at great length, in the past, in connection with the issue of building up reserve funds. The insurance analogy seemed to call for a large reserve fund, but the possible deflationary effects of building up such a fund were a major consideration in the shift to a virtual pay-as-you-go system. Moreover, many questioned whether a reserve fund invested in Government securities would have any real effect on national savings and investment. If the build-up of a financial reserve had no real effect on the rate of investment, the economic argument

[22] *Social Security Bulletin*, March 1967, table M–9, p. 31. These figures refer to retired workers only. They exclude dependents' and survivors' benefits.

[23] "In 1964, 16 percent of the 1,042,000 benefit awards were based on a PIA (primary insurance amount) at the minimum." (Lenore A. Epstein, "Workers Entitled to Minimum Retirement Benefits Under OASDHI," *Social Security Bulletin*, March 1967, p. 3.)

[24] Economic Aspects of the Social Security Tax (New York: 1966).

for a reserve fund was largely removed. In contrast the reserves of private pension funds are generally managed in such a way that they are directly channeled into real investment; they also appear to have the effect of increasing the rate of national saving. A pay-as-you-go social insurance system transfers income from the working population, who are savers, to the nonworking population, who for the most part are nonsavers. Consequently, such a system is likely to reduce the real rate of national saving and investment and thus decrease the rate of economic growth.

A pension system that does not serve to increase future national productive capacity from which increased pensions must be paid—and which may even reduce future growth—has a disadvantage in comparison with a system that serves to increase economic growth (on the assumption that a higher rate of economic growth is desirable). Particularly, when we are reaching a stage where public policies may have important effects on the relative growth of public versus private pension systems, the possible effects on economic growth become significant.

Under certain assumptions, reserve fund financing of social insurance could well lead to increased national saving and investment,[25] but it is by no means certain that a reserve fund invested in Government bonds will have this effect. An attempt to insure such an effect has been made under the Canada pension plan by investing its assets in Provincial government securities. Presumably the uses made of long-term borrowing by Provincial governments are such as to increase real national investment. Such investment of funds obtained from a compulsory government pension program does serve to reduce demands on the capital market by Provincial governments and should leave more funds available for private business investment.

In any case, there is a broad range of policies open to Government to promote economic growth, and the financing of a contributory social insurance program must be taken into account in formulating policies for growth and stability. However, this does not mean that social insurance financing should necessarily be used as a major instrument for pursuing such goals.

COORDINATION WITH OTHER PUBLIC POLICIES RELATING TO THE AGED

A revision of social insurance programs to put the primary emphasis on the contributory principle would necessarily involve revisions in other policies and programs affecting the aged. These include the income tax treatment of the aged, the tax treatment of private pension plans, and he coordination of social insurance with other welfare programs.

The increasing coverage and rising level of benefits under social security have made the issues of the various policies toward the aged closely interdependent. Issues in the tax treatment of the aged were of relatively minor importance when the level of social security benefits was so low in relation to the size of personal exemptions that few people were affected by tax exemption of social security benefits. But, rising levels of both public and private pension payments, combined

[25] Richard A. Musgrave, *The Theory of Public Finance* (New York: 1959), pp. 565–567.

with fixed dollar amounts of personal exemptions, make it more difficult to ignore the problems of equity involved in existing provisions for income tax treatment of the aged.

A shift to a social insurance system with primary emphasis on the contributory principle, combined with a separate financing of "welfare" elements, could provide a better basis for the income tax treatment of the aged.

Current exemption from taxable income of social insurance contributions, as under the Canadian system, and inclusion of benefits in taxable income at the time paid could improve individual equity by relating the income tax liability more closely to current disposable income (although this is not the only consideration involved). Such a change in the treatment of social insurance contributions has been proposed by several tax experts in the United States.[26]

The question of the respective roles of public and private pension plans has apparently been given relatively little consideration in the past. Lack of attention to this question has probably been due to the narrow coverage of private pension plans until recent years. As recently as 1950 private pension plans covered only 9.8 million persons, including those receiving benefits. In the same year 85.9 million persons (including retired beneficiaries) were covered by OASDI. In 1950 the number of persons covered by private plans amounted to 11 percent of those covered by OASDI. By 1965 this ratio has risen to 20 percent.[27]

The question of coordination of public policies on pensions and related systems is thus becoming much more important. Social insurance has generally been thought of as providing a "floor" of protection against loss of income and the other risks covered. However, a "floor" of protection is subject to a wide range of interpretation.

The level of contributory pensions, on an individual equity basis, should take account of the extent to which private pensions and other provisions for old age are likely to provide for old age. It would not be reasonable to provide compulsory governmental pensions at a level that would check the growth of private provision for old age. The coverage and benefits provided by private pension plans as time goes on will probably change substantially.[28]

At the low end of the benefit scale, concepts of adequacy have obviously dominated social security benefits. The OASI system was originally intended gradually to replace a substantial portion of old-age assistance, and it has at least partially achieved this goal. The number of old-age-assistance recipients reached a peak of 2.8 million in 1950 and thereafter declined steadily to 2.1 million in 1966.[29] Increases in receipts of other public assistance programs have, in part, offset this decline.[30] The close relation between OASDI programs and public

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[26] For example, Ray M. Peterson, "Federal Taxation in Relation to Lifetime Income Spreading and the Complementary Roles of the Public and Private Retirement Programs," in proceedings, 18th National Conference of the Tax Foundation, pt. II, *Pension Fund Problems, Private and Public* (New York: 1967), pp. 17, 18; Joseph L. Seligman, Jr., "Pension and Other Employee Benefit Plans," in *Tax Revision Compendium, Compendium of Papers on Broadening the Tax Base,* submitted to the Committee on Ways and Means, U.S. House of Representatives, November 1959, vol. 2, pp. 1368, 1369.

[27] Institute of Life Insurance, *Private and Public Pension Plans in the United States* (New York: 1967), p. 3.

[28] Further discussion of the relative roles of public and private pension programs can be found in Dan M. McGill, "Major Policy Issues in American Private Pensions," *Transactions, Social of Actuaries, 1966 Annual Meeting Number,* vol. 18, No. 52, pp. D408–D416. The expansion of public pension plans in Canada appears to have had a significant effect on private pension plans (Benjamin T. Holmes, *ibid.,* panel discussion, p. D442).

[29] *Social Security Bulletin,* June 1967, p. 43 and *Annual Statistical Supplement, 1965,* p. 103.

[30] Further discussion can be found in Robert J. Myers, *Social Insurance and Allied Government Programs* (Homewood, Ill.: Richard D. Irwin, Inc., 1965), ch. X.

assistance is indicated by the fact that about four-fifths of the old-age-assistance recipients also are OASDI beneficiaries.[31] At the low end of the income scale, the distinction between old-age assistance and OASDI benefits is tenuous. Although the OASDI benefit it technically paid without a "means test," the record of covered wages, as noted earlier, becomes essentially a means test for those receiving minimum benefits.

A two-tier system of "social insurance" has substantial possibilities for more equitable and more economic use of resources. An insurance portion, more strictly defined, would be limited to risks not covered by private insurance and pension plans. A welfare element, to be economic (in contrast with the wasteful type of universal old-age pension plan used in several countries), would have to be related to a measure of need, as minimum benefits under OASDI in effect now are. Separate financing of these elements would appear to be feasible on lines already used in supplementary medical insurance.

APPENDIX

A Diagrammatic Analysis of Social Insurance Taxes for Retirement Benefits [1]

A simplified model of the economy can serve to highlight the major issues of financing social insurances. The main question examined here is the relationship between a pay-as-you-go social insurance tax rate and an "actuarial" insurance tax rate. To put the problem another way, what is the relationship between a collective or aggregate view of social insurance financing and an individual's cost-benefit view?

Let us assume that—

(1) The population grows at a constant rate per year.

(2) Every individual enters the labor force at a given age, a_1, works through age a_2 and dies at age a_3+1.

(3) Everyone gets the same wage. (This is a useful simplifying assumption that serves to separate problems of financing over time from the problem of redistribution by income levels.)

(4) Everyone retires with a social insurance pension equal to the current wage, or some fraction of the current wage. (In the case of an increasing wage assumption—i.e., a model with increasing productivity—the individual's pension increases at the same annual rate as the wage.[2])

(5) Full employment is continuously maintained.

POPULATION AGE DISTRIBUTION AND THE SOCIAL INSURANCE TAX

Under the above assumptions, the population age distribution is shown in chart A–1. Since the population increases at a constant rate, the age distribution shows up as a straight line on a semilog chart. Although there is no zero boundary on such charts, area L can be taken as representing the labor force, and area R as representing the retired population.

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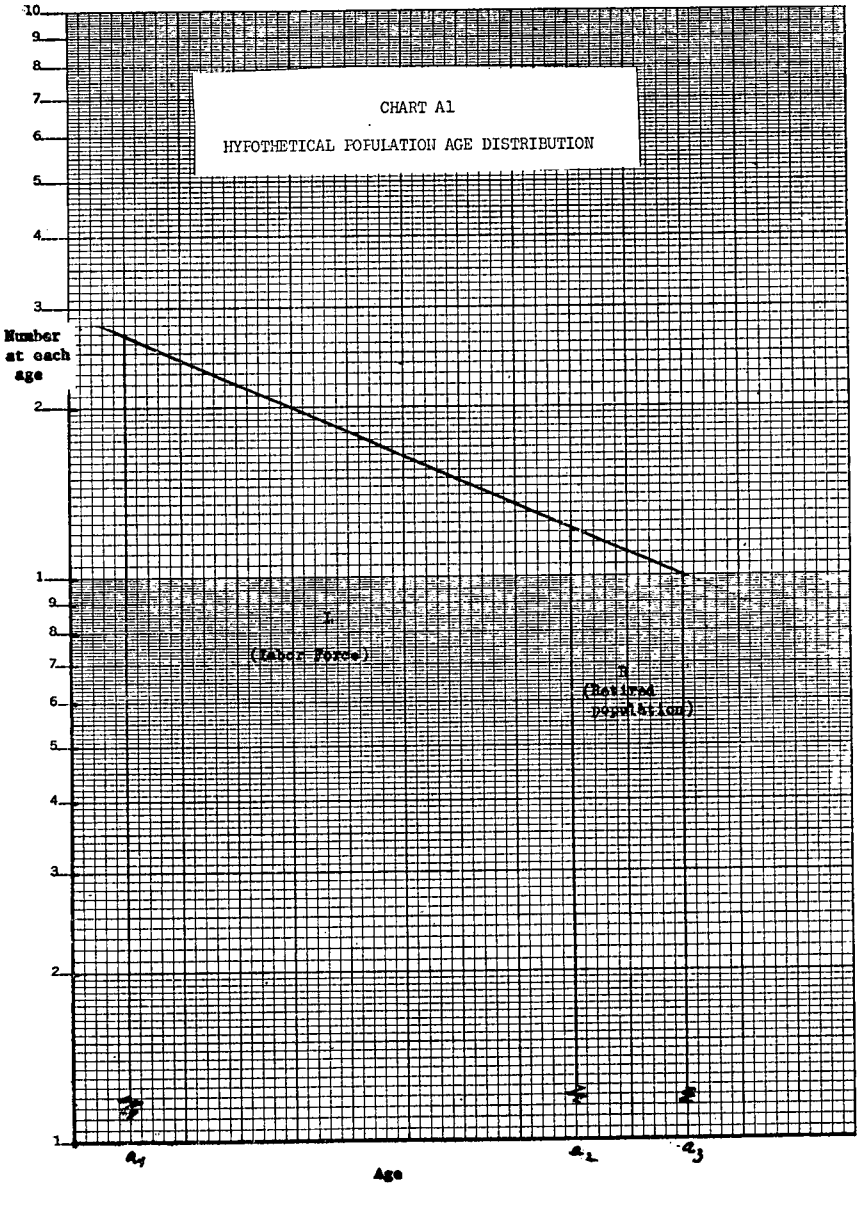
[31] *Ibid.*, p. 143.

[1] This analysis is largely based on Henry Aaron, "The Social Insurance Paradox," *Canadian Journal of Economics and Political Science*, vol. 32, No. 3, August 1966, pp. 371–374.

[2] In this case we will be using "double dynamic" assumptions, as Dr. Myers has referred to them; namely, a level of benefits tied to an increasing level of wages. (See above, pp. 25, 26, and *The 1966 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Trust Funds*, H. Doc. No. 392, 89th Cong., 2d sess., Feb. 28, 1967, pp. 39, 40.)



In any given year, if we assume that the pension is equal to the wage, the social insurance tax rate, on a pay-as-you-go system, must be equal to the ratio of the retired to the working population; namely,

$$\frac{R}{L}$$

The size of the retired population and the labor force depend on (1) the number of years people spend in retirement, $n=a_3-a_2$, (2) the

years spent in the labor force, $m=a_2-a_1+1$, and (3) the rate of growth of population.[3]

Altogether, the social insurance tax rate, F, is determined by four variables or constants:

p=the ratio of the pension to the wage
n=the number of years people spend in retirement
m=the number of years people spend in the labor force
t=1+the rate of growth of population.

It should be noted that the pay-as-you-go tax rate is not dependent on the level or rate of growth of wages. The whole operation of tax collection and pension payments may be assumed to occur within 1 year, so that we have no problem of payment lags.

Of the four factors affecting the social insurance tax rate, we might assume any three to be constant, and the fourth to be the main determinant of the tax rate. Thus, if we assume that the ratio of the pension to the wage, the number of years in the labor force and in retirement are constant, we can say that the pay-as-you-go tax rate depends on the rate of growth of population.[4]

THE INDIVIDUAL'S "ACTUARIAL" RATE

To turn from the aggregate point of view to the position of the individual, chart A–2 shows, with a constant wage level, the total amount of wages paid to an individual over his working life, area W (i.e., the rectangle $a_1a_2w_2w_1$). Similarly, the amount of pensions paid to an individual over his retirement years is represented by the area P (i.e., the rectangle $a_2a_3w_3w_2$).

If the interest rate were zero and he did not discount the future, the individual would have to save, or tax himself, at the rate

$$\frac{T}{W}=\frac{P}{W},$$

in order to provide himself for his old age (where T=total taxes paid, and P=total pensions received). The collective pay-as-you-go tax rate,

$$\frac{R}{L},$$

is necessarily less than the individual's required rate of saving,

$$\frac{T}{W},$$

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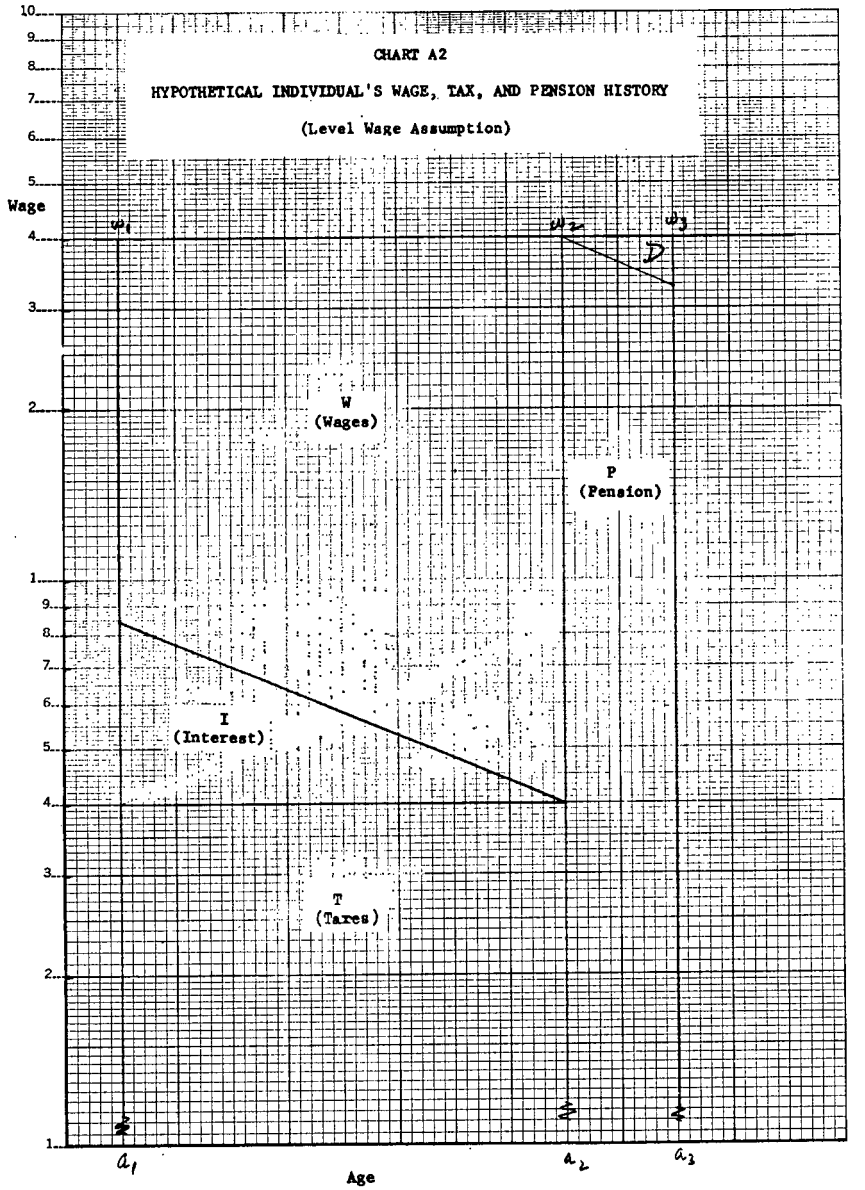
[3] The labor force, L, is the sum of the population in each age, a_1 to a_2: $L=P(1+t+t^2+\ldots\ldots+t^{m-1})$; where P is the oldest age group and Pt^{m-1} is the youngest age group in the labor force. Similarly, the retired population is the sum of the population in the ages a_0+1 to a_1: $R=P(t^{-1}+t^{-2}+\ldots\ldots+t^{-n})$ where Pt^{-1} is the youngest age group and Pt^{-n} is the oldest age group in the retired population. The social insurance tax rate, F, is determined by the ratio of the pension to the wage, p, and the ratio of retired to working population:

$$F=p\frac{R}{L}$$

[4] For the next three decades in the United States, the population aged 65 and over bears an almost constant ratio to the population aged 20 to 64. This ratio rises from 18.1 percent in 1965 to about 19 percent in 2000. (*United States Population Projections for OASDHI Cost Estimates*, Social Security Administration, Actuarial Study No. 62, Washington, D.C., December 1966, p. 23). Thus, it would be more realistic to say that the social insurance tax rate in the United States will depend upon the ratio of the pension to the average wage.

because of the growth of poulation. The social insurance tax rate will be smaller than the individual's required saving rate, the larger the number of people in the younger age groups available to make contributions.

How is the comparison affected if we take account of interest? If the individual has an interest rate available to him on his own savings (as risk free as the Government's promise to pay pension benefits), the interest on his savings will accumulate as shown by area *I* in chart A–2. If he discounts the value of his pensions at this same rate, the



discounted value of his pensions at the time of retirement is area P less area D. With interest available, he has to save, or tax himself, at a lower rate than with no interest because of the accumulation of interest on his savings and the discounting of the value of his pension.

Inspection of the charts suggests the break-even point. The advantage of the collective pay-as-you-go rate is just offset when the interest rate is equal to the rate of growth of population.[5]

If the interest rate exceeded the rate of population growth, the individual would fare better by doing his own saving than he would under a collective pay-as-you-go insurance system. The question of whether there would be a positive interest rate in an economy in which wages remained constant is a complex one. In a more elaborate model, Professor Samuelson has shown that under conditions similar to those assumed above, the interest rate will indeed be *determined* by the rate of population growth.[6]

THE INSURANCE TAX COMPARISON IN A PROGRESSING ECONOMY

We have shown that the collective pay-as-you-go tax rate is independent of the rate of growth of wages. However, the rate of growth of wages (or "productivity") affects the individual's calculation of his required rate of saving. With a growing wage rate, he will have to tax himself more in every year before retirement in order to provide a pension that grows with the level of wages from his year of retirement. If he is to keep up with the Jones' after his retirement, he will have to tax himself at a higher rate over his working life.[7]

Under an increasing-wage assumption, the additional saving required will more or less offset the additional value obtained from interest—depending on the extent to which the rate of interest exceeds to the rate of growth of wages.

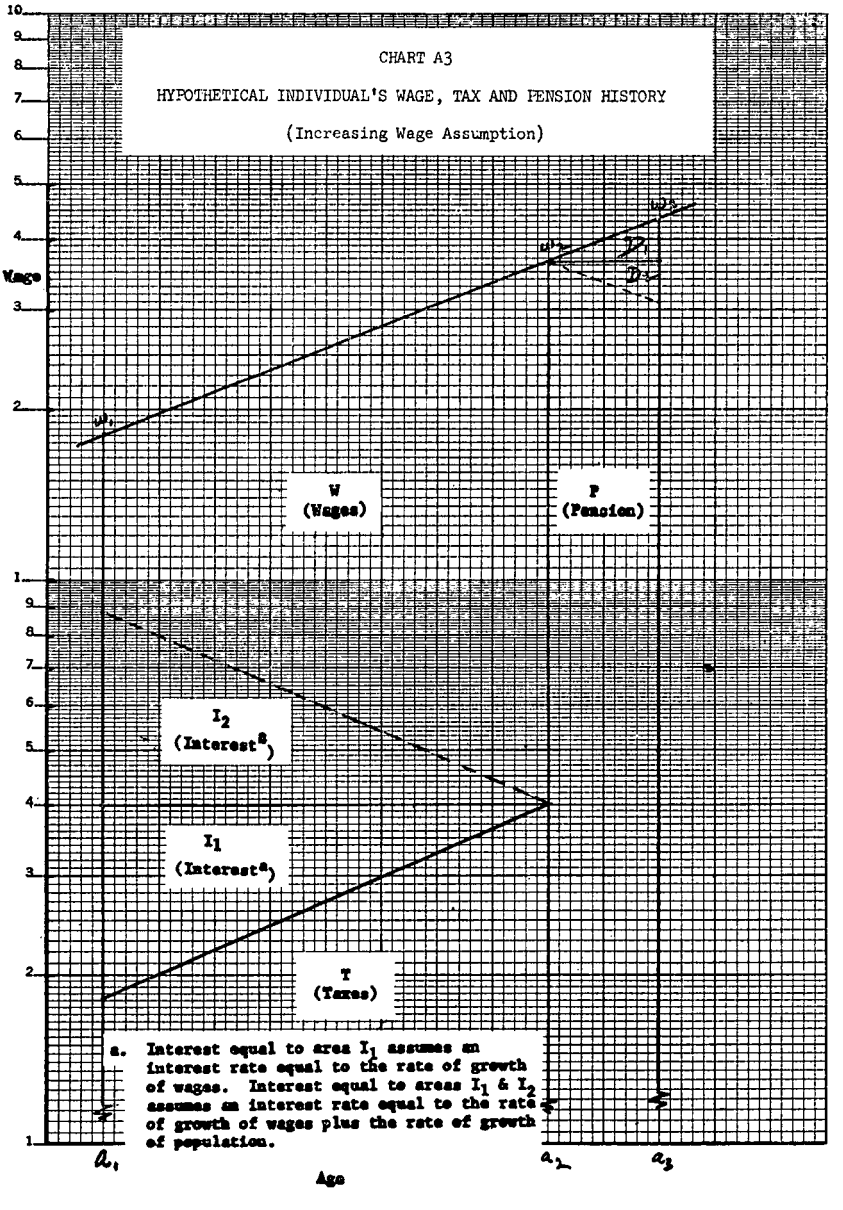
As Henry Aaron has shown in a slightly different formulation,[8] the collective pay-as-you-go rate will be equal to the individual's "actuarial" rate, where the interest rate is approximately equal to the sum of the rate of growth of population and the rate of growth of wages. This relationship is shown by a comparison of charts A–1 and A–3. In chart A–3, an increasing wage assumption is illustrated by the rising wage and tax curve. For the sake of direct comparison with chart A–1, interest is shown on chart A–3 accumulated graphically from year a_2 to year a_1. The interest shown in area I_1 is the amount that would be accumulated if the interest rate were just equal to the rate of growth of wages. The interest shown in area I_2 plus area I_1 is the amount that would be accumulated if the interest rate were just equal to the sum of the rate of growth of wages and the rate of growth

[5] Let T_m=the tax paid in the last year of working life, T'=the total taxes paid over the individual's working life, and r=1+the rate of interest. Then: $T'=T_m(1+r+r^2+\ldots+r^{m-1})$. Similarly, let w_2=the wage paid in the last year of working life, and P'=the discounted value of the individual's pension payments at the time of his retirement. Then: $P'=w_2(r^{-1}+r^{-2}+\ldots+r^{-n})$. From these equations and those in footnote 3, it follows that $T'=P'$ when the interest rate is equal to the rate of population growth.

[6] Paul A. Samuelson, "An Exact Consumption-Loan Model of Interest With or Without the Social Contrivance of Money," *Journal of Political Economy*, vol. 46, December 1958, pp. 467–482.

[7] Even if he chose only to provide himself a pension equal to the average wage when he retired, he would also have to save more in his working years when his wage averaged less than the wage in his last working year.

[8] *Op. cit.*, pp. 373, 374.



of population. (For illustrative purpose in these charts, the rates of growth of wages and population were assumed to be 2 percent per annum.) Inspection of charts A–1 and A–3 indicates that the social insurance tax rate,

$$F = p\frac{R}{L},$$

under these assumptions, is just equal to the individual's actuarial rate,

$$\frac{T'}{W},$$

where T', the accumulated amount of taxes plus interest over a working life is equal to P', the discounted value of pensions received over the years of retirement. Any ratio of the pension to the wage affects the social insurance tax rate and the individual's rate equally.

By way of comparison, individuals in 1967 could generally expect to get an interest rate on the order of 4½ percent on riskless forms of savings. The average rate of growth of "productivity" is on the order of 3 percent, depending on just how, and over what period, it is calculated. The expected rate of population growth (in age groups over 20) from 1965 to 2000 is just 1.5 percent.

There are, of course, various other influences affecting the comparison between social insurance and private saving for old age.[9] One of these is that that most private annuities and other forms of safe investments do not readily offer the individual the option of providing himself with a growing pension. However, the kind of comparison made above could also be made on the assumption that each individual retires with a pension equal to the wage (or some fraction of the wage) in his last working year. If everyone retired with a pension equal to the wage at the time *he* retired, the pay-as-you-go social insurance tax rate would be slightly lower, and so would the individual's "actuarial" rate.

More realistically, what is done in the United States is that Congress periodically takes a long-range (or intermediate-range) look at social insurance benefits and revises them upward on the basis of projections which assume continuation of the existing level of wages and a fixed scale of benefits. If this revision is done often enough, the "actuality" comes close, in its major relevant characteristics, to the model assumed above.

In one important respect, however, the above model differs from the actual situation: the model assumes a mature system in which everyone contributes for a full lifetime. In fact, the U.S. system is a long way from maturity both because few people have actually contributed for a working lifetime and because, as a result of liberalizations, far fewer people have contributed for a long period at a level of taxation consistent with the current level of benefits. This situation raises special problems.

PROBLEMS OF TRANSITION

The financing problems in a period of transition to a mature system depend upon the way in which transitional financing is arranged.

A social insurance system could be put into effect immediately with the same collective tax rate as under a mature system. Since it can be assumed that such a system would represent a taxing of all wages in one year to pay for the pensions of the retired population in that same year, the tax rate in the first year of operation would also be determined by the ratio of the retired to the working population (given the ratio

[9] Such matters as the absence of selling costs in a compulsory system will not be considered here.

of the pension to the wage and the number of years of working life and the number spent in retirement).

It might seem then that we have no problems of transition. It has been argued in most of the literature on this subject that under a pay-as-you-go system there is necessarily a large unfunded liability to be met during the transition to a mature system. Those who collect a full pension before contributing over a full lifetime receive a windfall.

It does not follow, however, that because of such windfalls, the younger age groups will pay a social insurance tax rate higher than their actuarial rate. The above analysis shows that the social insurance tax rate will be equal to the individual actuarial rate, for someone who works a lifetime under the system, where the interest rate is approximately equal to the sum of the rate of population growth and the rate of growth of wages. This will be true regardless of any unfunded liability. Here lies the paradox of social insurance. The younger age groups are taxed to provide for the aged, but the younger age groups also get an equivalent *quid pro quo* in the Government's promise to pay future benefits. At the same time, the aged receive windfalls. Is someone getting something for nothing—or without others having to give up something?

The answer to this paradox is to be found in the assumption of perpetual exponential growth.[10] The point to be emphasized in considering social insurance financing is that the pay-as-you-go insurance rate cannot, on assumptions used above,[11] exceed the highest individual actuarial rate as long as the interest rate does not exceed the sum of the rate of growth of population and productivity.

The problem of unfunded liabilities is essentially this: Only the youngest age group in the population will be paying its full actuarial rate. All older age groups will pay a progressively lower rate, actuarially, down to the group just retiring when the system is instituted; and this group pays a zero price unless there are provisions for actuarially reduced benefits and minimum periods of coverage necessary to qualify for benefits.

In order to minimize this price discrimination, most social insurance systems do not immediately pay full benefits. But, neither do they postpone full benefits until the system reaches maturity. Because full benefits are not postponed until the system reaches maturity, most individuals will pay a social insurance tax rate below their own individual actuarial rate. This unfunded liability, however, cannot make the collective tax rate *exceed* the individual actuarial rate, even for those just entering the labor force.

INCOME REDISTRIBUTION

It may be concluded that the cause of current high social insurance tax rates (in relation to actuarial levels for young age groups earning

[10] This assumption is the basis of certain get-something-for-nothing chain letter schemes. It was also the assumption underlying many fraternal insurance societies around the turn of the century. (Frank G. Dickinson, "The Social Security Principle," *The Journal of Insurance*, vol. 27, No. 4, December 1960, pp. 8–10.)

[11] One of these assumptions is that a free capital market exists and that private forms of savings are available to the individual. It was also assumed that the social insurance system would have no effect on the interest rate. In the extreme case, the Government could continue to raise its promise to pay until the pension was several times as large as the wage. If the tax rate rose to 100 percent, the rate of interest (and discount) would presumably be infinite.

the maximum taxable wage or more) is an element in the system which was excluded from the model used above; namely, redistribution by income level. The model assumed that everyone got the same wage and the same pension.

In the United States the retirement benefit is not a straight pension or annuity reflecting past levels of earnings. Rather, the benefit structure is set up so that, under the 1954 act; for example (later provisions are somewhat more complicated, but the same in principle), monthly retirement benefits amounted to 55 percent of the first $110 of average monthly covered wages, plus 20 percent of the next $240 of average monthly wages. Thus, the benefit structure is such as to provide a large discrimination in favor of very low incomes. On the other hand, the tax rate is a flat rate up to the maximum table wage. The structure of taxes and benefits together result in a large amount of income redistribution by income levels.[12]

Currently, average retirement benefits are substantially below the maximum benefits payable to those with covered wages equal to or in excess of the maximum (chart 1, p. 31). If the maximum wage base were substantially raised, and a benefit schedule similar to the present one (in relation to covered wages) were retained, the extent of redistribution by income level would be increased. In effect, further redistribution would be accomplished by greater price discrimination between those with high and low taxable earnings.

Redistribution effected through a system of price discrimination by income level will generally be less advantageous for the community as a whole than the same redistribution effected through an income tax and an equivalent subsidy to low income groups through transfer payments.[13]

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[12] Analyses of redistribution in the social security system can be found in Elizabeth Deran, "Income Redistribution Under the Social Security System," *National Tax Journal*, vol. 19, No. 3, September 1966, pp. 276–285; Ernest C. Harvey, "Social Security Taxes—Regressive or Progressive?" *National Tax Journal*, vol. 18, No. 4, December 1965, pp. 408–414; and Henry Aaron, "Income Transfers Under Social Security," in Otto Eckstein, ed., *Studies in the Economics of Income Maintenance* (Washington, D.C.: The Brookings Institution, 1967), pp. 61–72.

[13] A demonstration of this kind of proposition applied to medical care can be found in Kenneth J. Arrow, "Uncertainty and the Welfare Economics of Medical Care," *American Economic Review*, vol. 53, No. 5, December 1963, pp. 957, 958.

COST-BENEFIT RATIOS UNDER THE FEDERAL OLD-AGE INSURANCE PROGRAM

BY COLIN D. CAMPBELL* and ROSEMARY G. CAMPBELL

INTRODUCTION

What is the relationship between the value of accumulated old-age insurance taxes that persons pay into the OASDI trust fund and the retirement benefits that they can expect to receive on reaching age 65? If there were a close relationship between taxes paid in and the value of benefits received, the Federal old-age insurance program would conform to the popular conception of it as a kind of public insurance system. Workers covered by social security usually believe that they are paying for their future old-age benefits with the taxes they pay in during their working years. They conceive of themselves as purchasing an insurance policy, and for a person with the average life expectancy, the value of the taxes paid in would be similar to the value of the benefits received.

In keeping with this insurance conception of the program, social security benefits have often been referred to as annuities, and the tax payments have been called premiums. Originally, the Social Security Administration expected to accumulate a large trust fund. When the Federal old-age insurance program began, financing it by payroll taxes—even though they are regressive—was justified on the basis that it was an insurance system. Though the tax would be a much larger percentage of the income of the poor than of the rich, both would be paying for an annuity to be received during their old age. Such taxes would be in accordance with the benefit principle of taxation. Also, as an insurance program, no means test would be necessary to qualify for benefits on reaching age 65. Benefits were granted to all retired persons who qualified because it was believed that most would—more or less—have paid for their old-age pensions.[1]

Early in its development, the Federal old-age insurance program departed in practice from this insurance concept. From 1937 to 1950, planned tax increases from the original 2 percent were continuously postponed. There have been eight amendments raising benefits, including the benefits of those already retired. "New start" provisions permitting persons to use high-income years and shorter periods as the basis for benefits, were adopted in 1939 and 1950. Coverage has been expanded several times to bring in additional beneficiaries who have contributed little to the fund. The 1965 amendment extends coverage to self-employed physicians and improves benefits for di-

*Professor of Economics, Dartmouth College, Hanover, N.H.

[1] In the 1935 act, refunds, including a payment to compensate for interest, were to be paid to persons whose tax contributions were too small to make them eligible for benefits and to estates of persons who had not received in benefits the amount they paid in.

vorced wives and widows who remarry. More and more the system has provided pensions for all retired persons regardless of whether or not they have paid for them.

The following examination of cost-benefit ratios under the Federal old-age insurance program shows how far the program has, in fact, departed from the popular conception of insurance. Section I includes estimates of cost-benefit ratios for persons retiring in 1967. Section II includes estimates of cost-benefit ratios as provided in the law for young persons entering the system. Section III outlines some of the problems in making cost-benefit estimates.

I. Cost-Benefit Ratios for Persons Retiring in 1967

A person retiring in 1967 could have paid social security taxes for no longer than 30 years. The value of his OASDI taxes accumulated at rates of interest on series E savings bonds until 1963 and 4 percent thereafter is at most $6,580—$4,720 in taxpayments and $1,860 in interest. Table 1 shows that up to 1950 the maximum taxpayment per year for old-age and survivors insurance was only $60. The tax rate was 2 percent—1 percent on the employer and 1 percent on the employee—and the maximum wage base was $3,000. Since 1950, the tax rate and the wage base have been gradually raised. In 1966 the tax rate, excluding medicare, was 7.7 percent; the maximum wage base, $6,600; and the maximum taxpayment, $508 per year.

TABLE 1.—COMBINED EMPLOYER-EMPLOYEE TAX RATE, THE MAXIMUM WAGE BASE, AND THE MAXIMUM ANNUAL TAXPAYMENT UNDER OASDI, EXCLUDING MEDICARE

Years	Combined employer-employee tax rate (percent)	Maximum wage base	Maximum tax payment per year
1937–49	2	$3,000	$60
1950	3	3,000	90
1951–53	3	3,600	108
1954	4	3,600	144
1955–56	4	4,200	168
1957–58	4.5	4,200	189
1959	5	4,800	240
1960–61	6	4,800	288
1962	6.25	4,800	300
1963–65	7.25	4,800	348
1966	7.7	6,600	508
1967–68	7.8	6,600	515
1969–72	8.8	6,600	581
1973 on	9.7	6,600	640

A person retiring in 1967 has had, since 1939, survivors' insurance for his wife and young children in case he died early. Since 1956, he has also had disability insurance. If it is assumed that 20 percent of taxpayments of the worker who lives to retirement has gone to pay for these other forms of insurance, this person has paid a maximum of $5,263 for old-age insurance alone.

A worker retiring in 1967 who has paid in the maximum is entitled to an annual pension of $1,631, plus $816 for an aged wife, a total of $2,447. As shown in table 2, a pension of this amount, discounted at 4 percent for the average length of life that they can expect—14 more years—is worth $26,631. Their social security benefits are worth five times the value of the payroll taxes he has paid in.

TABLE 2.—COST-BENEFIT RATIOS FOR PERSONS ALREADY RETIRED UNDER THE FEDERAL OLD-AGE INSURANCE PROGRAM

Age and starting date under OASI	Retirement date	Average annual wage	Total value of OASDI taxes [1]	Total value of taxes for old-age insurance alone [2]	Annual pension for man and wife	Value of pension for 14 years [3]	Cost-benefit ratio (column 5 divided by column 7, percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Married man:							
40 in 1937	1962	Maximum base	$3,782	$3,026	$2,330	$25,358	12
37 in 1937	1965	Maximum base	5,200	4,160	2,371	25,804	16
35 in 1937	1967	Maximum base	6,579	5,263	2,447	26,631	20
35 in 1937	1967	¾ maximum base	4,934	3,947	2,023	22,017	18
35 in 1937	1967	½ maximum base	3,289	2,632	1,618	17,609	15
Married man, with a tax payment computed in terms of constant dollars: 35 in 1937.	1967	Maximum base	8,700	6,960	2,447	26,631	26
Married man with working wife: 35 in 1937.	1967	Maximum base	13,157	10,526	3,262	35,501	30
Single person: 35 in 1937	1967	Maximum base	6,579	5,263	1,631	17,750	30
Self-employed, married man: 49 in 1951.[4]	1967	Maximum base	3,635	2,908	2,447	26,631	11

[1] Compounded at E-bond rates until 1963 and 4 percent thereafter.
[2] 80 percent of column 4.
[3] Discounted at 4 percent interest.
[4] First covered in 1951.

Many retired workers have had an even more attractive bargain. Social security pensions may now be based on covered wages only since 1951, and the lowest 5 years in wages may be excluded. It is possible for a worker retiring in 1967 to obtain a pension worth $26,631 even if he paid no taxes before 1956, but maximum taxes since then. At age 65, the value of such a person's taxpayments for old-age insurance would be only $3,037. He would receive almost nine times what he has paid in. Most workers who have been "blanketed" into the system since it began have received similar bargains, although over time the low cost-benefit ratios of these groups will disappear. Coverage was extended to domestic workers, farm wage workers, and the self-employed in 1951, self-employed farmers in 1955, dentists and military servicemen in 1965, and self-employed physicians in 1965. In 1950 only 62 percent of the labor force was covered compared with over 90 percent in 1967.

A group that has not had such a good bargain is those who are single at retirement—whether a bachelor, widower, or in some cases, divorced. A single worker who has paid maximum taxes since 1937 and retires in 1967 is entitled to receive a pension of only $1,631 per year. This is because he does not receive a secondary benefit for an aged wife. Single persons are not supposed to need as large a pension as married couples—although this is not always the case. This pension is worth $17,750, compared to the total value of his taxes for old-age insurance of $5,263. His cost-benefit ratio is 30 percent. (See table 2.)

The cost-benefit ratios of working couples are also relatively high. If a man and his wife, retiring in 1967, have both been employed and paid maximum taxes since 1937, together they will have paid in taxes worth $10,526. But, a wife cannot receive both the pension she is entitled to as a wife and the pension she herself has earned. She receives only the larger of the two. A working wife is not supposed to need both the wife's portion of her husband's pension and the pension she her-

self would be entitled to through her own tax payments. The maximum amount that this retired couple may receive is $1,631 each, a total pension of $3,262 per year. A pension of this amount, discounted at 4 percent to age 65, is worth $35,500, and their cost-benefit ratio is 30 percent.

Married women workers are a significant group in the total labor force, and their numbers have been growing rapidly. In 1940 there were only 7 million married women workers in a labor force of approximately 56 million persons. In 1964 there were about 20 million married women workers (including widows) out of a total labor force of some 74 million. In most cases, a married woman worker will not have worked long enough or at high enough wages to earn an old-age benefit that is larger than the amount she would automatically be entitled to as a wife (half her husband's benefit). A woman worker retiring in 1967 must be employed at least 3¼ years in order to be eligible for benefits of her own, and 8 years' wages must be averaged to compute benefits. If she has worked over 3¼ years, but less than 8 years, zeros are counted for the years in which she was not employed, and her benefits will tend to be low. In the future, the law provides that a woman born after 1928 be employed at least 10 years to be eligible for benefits on reaching age 65 and that wages for 35 years be averaged as a basis for her benefits.

How have retired persons who have earned less than the maximum wage base fared under the Federal old-age insurance program? A worker, retiring in 1967, who has paid taxes on three-quarters of the maximum base since 1937 has paid old-age taxes worth $3,947. He and his wife would be eligible for an annual pension of $2,023. Such a pension is worth just over $22,000, and his cost-benefit ratio is 18 percent, as compared with 20 percent for the worker who has paid the maximum tax. If he has paid one-half the maximum tax since 1937, the cost-benefit ratio would be 15 percent. The lower cost-benefit ratios for persons with wages below the maximum wage base are intentional. The social security law does not reduce their benefits in proportion to the taxes paid in.[2]

Self-employed persons, another distinct group under the social security program, have relatively low cost-benefit ratios because their tax rate is one and a half times the employee's tax rate (or three-fourths the combined employee-employer tax rate). Also, they were first included in 1951. The purpose of the lower tax rate on the self-employed was to avoid overtaxing the self-employed relative to those working for an employer, on the assumption that the entire tax on the employer is not shifted to the employee. Table 2 shows that the

[2] Although the law provides for higher cost-benefit ratios for persons with higher average annual incomes up to the maximum wage base, there are several offsetting factors that may, in fact, reduce cost-benefit ratios for the higher income groups and raise them for the lower income groups. Higher income groups probably live longer on the average than lower income groups and thus collect benefits for a longer period of time. Also, the exclusion of social security old-age benefits from Federal income taxation raises the benefits of higher income groups relative to the taxes paid in. Eventually persons with low incomes will pay in taxes for a larger number of years because they typically start to work at a younger age. Also, if there is a larger percentage of working couples among lower income groups than among higher income groups, this would tend to raise cost-benefit ratios for the lower income groups. In addition, the work income test which excludes some persons who work after 65 from receiving old-age benefits may affect the lower income groups more adversely than the upper income groups.

maximum accumulated tax payments for old-age insurance of a self-employed person retiring in 1967 is $2,908, compared with benefits for himself and his wife worth $26,631. This is a cost-benefit ratio of only 11 percent. In 1965, 6.6 million persons out of 62.7 million—11 percent of civilian employees covered by OASDI—were self-employed.[3]

The estimated cost-benefit ratios for different groups of persons retiring in 1967, shown in table 2, indicate that the prevailing conception of social security as an insurance program in which workers are purchasing an annuity is incorrect. In fact, a significant net transfer over their lifetime is being made to the 15 million persons who are currently receiving old-age pensions.

Because of the inflation between 1937 and 1967, the real value of the taxes paid in is larger than the nominal amount. Table 2 shows that in terms of 1966 dollars the total value of tax payments for old-age insurance for the man contributing the maximum from 1937 through 1966 is $6,960, approximately 32 percent more than the nominal value. Even so, the value of his tax payments for old-age insurance alone would be worth only 26 percent of the value of the pension he is entitled to for himself and his wife.

Table 2 also shows that cost-benefit ratios for persons retiring in recent years have been increasing. The married man who retired 5 years ago, in 1962, paid in, at most, only 12 percent of the value of his pension. Two years ago it was 16 percent. Today, it is 20 percent. The reason for this increase is that payroll taxes have been increased sharply. Underlying this is the fact that the old-age insurance system attempts to collect each year just enough through the payroll tax and through interest on the trust fund to cover benefit disbursements. The system has become more costly as larger numbers of persons have retired who are eligible for higher benefits, and as benefits for those already retired have been increased to keep up with the cost of living or to provide larger minimum benefits.

Because of the variation in the cost-benefit ratios among different categories of retired workers, the social security program is transferring more income to some groups than to others. Those benefited most are the self-employed, those blanketed in after the program was initiated, workers whose wives have not been employed, and workers with less than the maximum wage base. Those benefited least are single persons and working couples.

II. Cost-Benefit Ratios for Young Persons

For young persons, cost-benefit relationships are uncertain. The tax rate on payrolls, the maximum wage base, and benefit levels may be raised in the future, and future trends in interest rates are difficult to forecast. Nevertheless, an examination of the cost-benefit ratios in the current law for young persons entering the system shows some of the problems ahead.

A young person starting work in 1967 at the age of 22 and earning at least $6,600 per year for the next 43 years is scheduled to pay

[3] *Social Security Bulletin*, Annual Statistical Supplement, 1965, page 4.

OASDI taxes (excluding medicare) worth $68,076, if 4 percent interest is assumed. (See table 3.) In 1967 the rate of tax for old-age, survivors, and disability insurance was 7.8 percent, and the maximum tax per worker was approximately $515 per year. This total will be gradually increased until it reaches $640 in 1973. The tax payments over his lifetime amount to approximately $27,000, and the accumulated interest to $41,000. After deducting 20 percent of the total value of his taxes for survivors and disability insurance, the amount paid in for old-age insurance alone would be $54,461.

TABLE 3.—COST-BENEFIT RATIOS FOR PERSONS OF DIFFERENT AGE SCHEDULED UNDER THE CURRENT FEDERAL OLD-AGE INSURANCE PROGRAM

Age and starting date	Retirement date	Average annual wage	Total value of OASDI taxes [1]	Total value of taxes for old-age insurance alone [2]	Annual pension	Value of pension for 14 years [3]	Cost-benefit ratio (col. 5 divided by col. 7) (percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Married man:							
30 in 1937	1972	Maximum base	$11,000	$8,800	$2,636	$28,688	31
22 in 1937	1980	Maximum base	20,873	16,698	2,776	30,212	55
22 in 1945	1988	Maximum base	32,002	25,602	2,848	30,995	83
22 in 1949	1992	Maximum base	38,932	31,145	2,871	31,246	100
22 in 1955	1998	Maximum base	50,108	40,087	2,963	32,247	124
22 in 1967	2010	$6,600 or more	68,076	54,461	3,024	32,911	165
22 in 1967	2010	$4,950	51,057	40,846	2,496	27,164	150
22 in 1967	2010	$3,300	34,038	27,230	1,927	20,977	130
Married man with working wife: 22 in 1967.	2010	$6,600 or more each.	136,152	108,922	4,032	43,881	248
Single person: 22 in 1967	2010	$6,600 or more	68,076	54,461	2,016	21,941	248
Self-employed, married man: 22 in 1967.	2010	$6,600 or more	49,608	39,686	3,024	32,911	121

[1] Compounded at E-bond rates of interest until 1963 and 4 percent thereafter.
[2] 80 percent of column 4.
[3] Discounted at 4 percent interest.

The maximum retirement benefit that this young worker is scheduled to receive is $3,024 per year—$2,016 for himself and $1,008 for his aged wife. A pension of $3,024 at age 65 could be financed with accumulated tax payments of only $32,911—much less than the value of the taxes he is scheduled to pay in. This young worker's cost-benefit ratio is 165 percent.

Table 3 shows that if workers have paid in the maximum taxes and expect to continue to do so until retirement, the break-even point under the present law is 39 years of age. Workers older than this gain; workers less than 39 years of age lose. For those with incomes below the maximum wage base, the break-even age is lower. Young men who are married and earn less than the maximum wage base have relatively small cost-benefit ratios, even though in both cases shown in table 3 the cost exceeds the benefits. In addition, cost-benefit ratios are relatively low for self-employed young persons starting employment in 1967, but very high for single persons.

Over the years, the prospective cost-benefit ratios for the young entrant into the labor force have varied. Table 4 shows that in 1937 the cost-benefit ratio for the young worker starting employment at age 22 was 133 percent. At that time, it was thought that young workers

and their employers would have to pay in somewhat more than the value of their own pensions in order to provide pensions of reasonable size to those who would retire soon after the program began. The 1950 amendment to the Social Security Act significantly lowered the cost-benefit ratio for young workers because of the substantial increases in benefits made at that time. Since 1950, cost-benefit ratios have risen from 100 percent to their present high levels primarily because of new programs widening the coverage, higher minimum benefits, and the maturing of the system.

TABLE 4.—COST-BENEFIT RATIOS FOR NEW ENTRANTS UNDER PROGRAMS EXISTING AT TIME OF ENTRY

Starting date at age 22	Total value of expected taxes [1]	Total value of expected taxes for old-age insurance alone [2]	Annual pension scheduled for man and wife	Value of expected pension for 14 years [3]	Expected cost-benefit ratio (col. 3 divided by col. 5)
(1)	(2)	(3)	(4)	(5)	(6)
1937	$14,776	[4] $14,776	$1,020	$11,101	133
1950	19,665	15,732	1,440	15,672	100
1960	43,509	34,807	2,286	24,879	140
1965 [5]	47,877	38,302	2,286	24,879	154
1967	68,076	54,461	3,024	32,911	166
Under proposed 1967 amendments:					
1968	109,449	87,559	4,440	48,321	181
1974	118,813	95,050	4,536	49,366	193

[1] Compounded at E-bond rates of interest until 1963 and 4 percent thereafter.
[2] 80 percent of col. 2.
[3] Discounted at 4 percent interest.
[4] The social security system did not include survivors and disability insurance in 1937.
[5] Prior to amendments of 1965.

Recently proposed amendments to the Social Security Act would increase further the cost-benefit ratios of young workers. Table 4 shows that under H.R. 5710, the amendment to the Social Security Act proposed in 1967, the cost-benefit ratio for a young married worker paying the maximum in taxes would rise to 193 percent by 1974.[4] This law would increase minimum benefits from $66 to $105.

What can be definitely said about the current tax and benefit schedules is that benefits must be increased in the future if young persons today are going to get their money's worth. But, if benefits are increased in the future, will payroll tax rates also have to be increased? This will depend primarily on the extent to which growth in the labor force and increases in the productivity of labor can support the required increases in revenues without an increase in tax rates. Also, it will depend on whether or not the maximum wage base of the payroll tax is raised with increases in labor productivity. Under the present law, social security taxes automatically rise with the wages of persons earning less than the maximum wage base, but for other workers increases in the wage base require an act of Congress. During the past 30 years, the maximum wage base of the social security tax has been raised only four times.

[4] H.R. 5710 also sets a ceiling of $90 a month for benefits to nonworking wives—much less than half the maximum proposed primary benefit of $288 per month. This would result in higher cost-benefits ratios for couples without a working wife.

If increases in revenues from payroll taxes based on increases in the productivity of labor are needed in the future to give young workers their money's worth, such funds will not be available to support further developments of the social security system as an antipoverty program. The historical development of the social security system has been toward the granting of more adequate benefits to persons regardless of whether or not they have paid for them. If this trend continues, substantial additional revenue will be needed to support both the insurance and the welfare objectives of the social security system. Continuous increases in the maximum wage base and either higher payroll tax rates or the development of other sources of revenue will probably be necessary.

III. Some Problems in Making Cost-Benefit Comparisons

The computer programs used to calculate the total value of the taxes paid in and the benefits expected are shown in figures 1 and 2.[5] The program in figure 1, entitled "Taxes," illustrates the method of calculating the total value of the taxes paid in by a young worker entering the system at age 22 in 1967. He is scheduled to pay $514.80 per year in taxes for 1967 and 1968, $580.80 per year from 1968 to 1971, and $640.20 per year from 1972 until retirement 37 years later. A rate of interest of 4 percent is assumed. The value of the taxes he pays in is $68.076, as shown in table 3.

The program in figure 2 entitled "Annuity" illustrates the method of calculating the value of the benefits expected by a worker retiring in 1967 who has earned the maximum benefit and has a wife who is also 65. They are entitled to a benefit of $2,447 per year. It is assumed that they can expect to live 14 years and that the rate earned on the unused balance is 4 percent. The value of their benefits is $26,631, as shown in table 2.

(a) *What rate of interest should be used?*

To estimate the value of taxes paid by an employee and his employer, the tax payments of persons retiring in 1967 were compounded at current rates of interest on alternative forms of saving. The following rates of interest on E bonds were used until 1963 and 4 percent, the rate on savings deposits, was used thereafter:

Rates of interest on series E, U.S. savings bonds

Years	*Rate of interest (percent)*
1937 to mid-1952	2.9
Mid-1952 to 1956	3.0
1957 to mid-1959	3.25
Mid-1959 to 1962	3.75

For discounting future benefits and for estimating the value of taxes paid in the future, a rate of interest of 4 percent was considered to be as good a forecast as possible. For persons retiring in 1967, changes in the rate of interest used do not change significantly the resulting cost-

[5] These programs are written in basic. See John G. Kemeny and Thomas E. Kurtz, "Basic," third edition. (Hanover, N.H., Dartmouth College Computation Center, Jan. 1, 1966).

Figure 1

```
TAXES

10  READ X, S
20  FØR N = 1 TØ 3
30  READ Y (N)
40  READ T (N)
50  NEXT N
60  FØR Q = 1 TØ 3
70  FØR F = 1 TØ T (Q)
80  LET S = (S.* X) + Y (Q)
90  NEXT F
100  NEXT Q
110  PRINT S
120  DATA 1.04,0, 514.80, 2, 580.80, 4, 640.20, 37
130  END

RUN

TAXES

68076.
```

Figure 2

```
ANNUITY

10  READ X,Y
20  LET S = 0
30  FØR N = 1 TØ 14
40  LET S = S + X * (1-Y)↑(N-1)
50  NEXT N
60  PRINT S
70  DATA .2447, .04
80  END

RUN

ANNUITY

26631.1
```

benefit ratios. The cost-benefit ratio for a married person retiring in 1967, who has paid in the maximum, is 18 percent using 3 percent interest, 21 using 4 percent, and 25 using 5 percent interest. But, for a young person entering the system in 1967, changes in the rate of interest cause large differences in cost-benefit ratios. For a married man paying the maximum, the cost-benefit ratio is 121 percent using 3 percent interest, 165 percent using 4, and 227 percent using 5 percent interest. This is because the taxes paid by young workers are accumulated over 43 years rather than 30 years. Also, the early tax payments, which are held the longest and account for much of the accumulated interest, are larger for young entrants today than they were for persons retiring in 1967.

(*b*) *What life expectancy should be assumed?*

The Life Insurance Fact Book gives the following predictions of life expectancy for persons who were 65 years of age in 1964: [6]

Color and sex	*Years remaining at age 65*
White male	13.0
White female	16.3
Nonwhite male	12.8
Nonwhite female	15.6
Average, all races	14.6

To simplify the calculations, all of the estimates in this study assume the same life expectancy for both husband and wife (14 years) and the same age for both husband and wife. More exact assumptions would change the cost-benefit ratios very slightly. Also, it was assumed that life expectancy would not change in the decades ahead.

(*c*) *What is the cost of survivors and disability insurance?*

The cost-benefit ratios estimated in this study are retrospective. They refer to persons who live to age 65 and retire.[7] The value of the taxes paid in is the total amount accumulated over the working life of a person up to age 65. The estimated value of the old-age benefits is based on the expected life of a man and his wife at age 65.

Part of the payroll taxes that persons pay prior to reaching age 65 represent the cost of the disability and survivors insurance that they have had during their working years. In 1965, payments for survivors and disability insurance amounted to $5.6 billion, approximately 30 percent of total OASDI payments of $18.3 billion. This is considerably more than the 20 percent deduction assumed in this study. The reason for the difference is that in this study, payments to widows of husbands who live to age 65 are considered as old-age rather than survivors insurance benefits. The estimated deduction of 20 percent includes the total cost of disability insurance, but only that portion of survivors benefits paid to young widows with children and to aged widows of insured persons who died before age 65.

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[6] Life Insurance Fact Book, 1966 (New York, Institute of Life Insurance, 1966), p. 95.

[7] Persons not living to age 65 pay in differing amounts of taxes, depending on how long they live. Most of them live until near age 65 and pay in close to the full amount of taxes for persons with their incomes. Even though they do not receive old-age benefits, their survivors—widowed mothers with children under their care and their widows on reaching age 65—do.

The social security law allocates seven-tenths of 1 percent (raised from one-half of 1 percent in 1965) of covered payrolls to a special disability insurance trust fund. On this basis, the funds allocated for disability insurance amount to approximately 9 percent of total payroll taxes for OASDI.

No specified amount is set aside for survivors' benefits. Approximately one-third of those who start work in their early twenties do not live to age 65.[8] If it is assumed that two-thirds of the survivors' benefits paid to widows are paid to widows of workers who live to retirement, the remaining percentage of total benefits for disability and survivors insurance is approximately 20 percent.[9]

NUMBER OF SURVIVORS AT SINGLE YEARS OF AGE, OUT OF 100,000 BORN ALIVE, BY COLOR AND SEX, UNITED STATES, 1964

Age	White male	Nonwhite male
20	96,099	93,334
65	66,009	50,341

(d) Is the payroll tax on the employer a cost to the employee?

In this study, both the portion of the payroll tax that is nominally paid by the employer and the portion deducted from the employee's paycheck are included in the cost to the worker of his old-age pension. This is based on the belief that payroll taxes on an employer are soon shifted to his employees. A payroll tax increases the employer's labor cost and decreases his demand for labor. This spread over all firms slows up the rise in wages, so that the wage earner, in effect, pays the employer part of the tax as well as that nominally levied on the employee.[10]

Beliefs concerning the incidence of the payroll tax on the employer vary widely. The estimates of cost-benefit ratios by Myers and Oppal and by Peterson, shown in table 5, exclude completely the payroll tax on the employer. On the other hand, in a recent study of social security contributions and benefits, Aaron makes the same assumption as in this study—that the entire tax on the employer is shifted to the worker.[11] Aaron relates the old-age pensions of typical workers in various industries to their "actuarially justified annuities." Although he presents the comparison in a different way, the issues discussed are similar to those in the studies of cost-benefit ratios.

[8] The following figures are taken from U.S. Department of Health, Education, and Welfare, Vital Statistics of the United States, 1964, vol. II, Mortality, Pt. A, sec. 5, table 5-3.

[9] Estimates of the cost of different components of social security coverage may be found in table 14 of Robert J. Myers, "Social Insurance and Allied Government Programs" (Homewood, Ill., Irwin, 1965), p. 125.

[10] For an interesting account of the incidence of the payroll tax on the employer, see Paul Douglas, "Social Security in the United States," second edition (New York, Whittlesey House, 1939), pp. 62–68. He concludes that under conditions of pure competition, the entire cost of the tax on the employer would be transferred to the workers, and under monopoly, in most cases, it would be at least partially shifted.

[11] Henry Aaron, "Benefits Under the American Social Security System," in Otto Eckstein, edition, Studies in the Economics of Income Maintenance (Washington, D.C., Brookings, 1967), pp. 63–67.

TABLE 5.—COMPARISON OF COST-BENEFIT RATIOS MADE BY MYERS AND OPPAL, PETERSON, AND CAMPBELL

[In percent]

Retirement date	Myers and Oppal [1]	Peterson			Campbell
	Interest rate used				
	3 percent	3 percent	3½ percent	4 percent	4 percent
	(1)	(2)	(3)	(4)	(5)
Married man:					
1962	7.6	7.2	7.9	8.6	12
1965	10.2	9.5	10.4	11.4	16
1970	16.0	14.7	16.2	17.8	.....
1980	31.4	29.9	33.6	37.7	55
1990	47.8	47.6	54.3	62.0	.....
2000	66.6	66.8	77.9	90.9	.....
2010	78.6	82.7	97.9	116.2	165
Single man: 2010	132.6	139.7	164.9	195.1	248

[1] Prior to 1965 amendments.

Source: Robert J. Myers and Bertram Oppal, "Studies on the Relationship of Contributions to Benefits in Old-Age Benefit Awards," actuarial note No. 20 (Washington, U.S. Department of Health, Education, and Welfare, Social Security Administration, June 1965), table 3; and Ray M. Peterson, addendum to table 3 of actuarial note No. 20, issued June 1965 by the Social Security Administration. Elizabeth Deran uses estimates by Ray M. Peterson in her study, "Income Redistribution Under the Social Security System," Nat. Tax Jour., XIX (September 1966), pp. 281 and 284. Estimates by Peterson were also used in the Tax Foundation, "The Economic Aspects of the Social Security Tax" (New York, Tax Foundation, Inc., 1966), p. 48.

Because both the study by Myers and Oppal and that by Peterson assume that the tax on the employer is not shifted to the worker, their estimates of cost-benefit ratios are considerably smaller than those made in this study. (See table 5.) This difference alone would cause their estimates of the cost to the worker of social security benefits to be one-half those in this study. Another difference between their estimates and those here is that they did not deduct 20 percent of the taxes paid in for survivors and disability insurance. This difference would tend to make their estimates larger than those in this study. A third difference is the interest rates used. The use of 3 percent by Myers and Oppal is lower than the rates assumed since 1957 in this study and would tend to make their estimated cost-benefit ratios relatively low. They also assume the person started work at age 20 rather than at age 22—tending to make their cost-benefit ratios slightly higher.

(*e*) *Should an adjustment be made for the tax-free nature of social security benefits?*

The estimates of cost-benefit ratios in this study have not taken into consideration the tax-free status of social security benefits. To persons in high income brackets, social security benefits are worth more than their face value. For example, if a retired person is in the 19 percent bracket, additional tax-free income of $2,400 is worth over $3,000. If a person is in the 50 percent bracket, it is worth $4,800. The cost-benefit ratios of retired persons in high income brackets, taking account of this factor, would decline as their income increases.

(*f*) *Should a tax-free build up of contributions be assumed?*

The estimates of the value of the taxes contributed in tables 2, 3, and 4 assume that the accumulated interest earned is not taxed as

personal income. Social security taxes are treated like premiums of a private annuity. The earnings are built up, tax free, during the period in which premiums are paid in. If it were assumed that the annual interest income was taxed as current income, the accumulated value of the social security taxes paid in would be less and the cost-benefit ratios would be smaller.

IV. Conclusion

Despite different possible assumptions, the studies of cost-benefit ratios that have been made by various authors lead to similar conclusions.[12] The first is that the insurance concept of the social security system in which workers are supposed to be purchasing an old-age annuity with the taxes they and their employer are paying is largely a myth. It is a popular analogy and is often repeated in newspaper editorials and statements by public officials, but, there is, in fact, little to support it. The second conclusion is that cost-benefit ratios vary considerably depending on the age, sex, income, and occupation of a person. Some of these differences are the result of ad hoc changes in the program as it has developed. There is a need to reexamine social security as a program of income transfers in order to assure that it is fulfilling the objectives of public policy. Although it is usually assumed that the social security system redistributes income so as to benefit lower income groups, it is not obvious that it is actually doing so. The final conclusion is that unless the tax paid by the employer is not, in fact, a cost to the employee, the cost-benefit ratios of young entrants into the labor force have become very high. Because scheduled benefits may be raised in the future, the terms of the current law do not necessarily mean that young persons are not going to get their money's worth. They do indicate the need for a social security model which explicitly assumes increasing benefit levels. One of the objectives of such a model might be to provide a closer balance between costs and benefits for young workers.

[12] See particularly Ray M. Peterson, "Misconceptions and Missing Perceptions of Our Social Security System (Actuarial Anesthesia)," Transactions of the Society of Actuaries, XI (November 1959), 812–851, and "People, Pensions, and Production," address at 11th Annual Southwestern Economics Forum, University of Southwestern Louisiana, Lafayette, La., Mar. 7, 1962.

INFLATION AND PRODUCTIVITY IN TAX-BENEFIT ANALYSIS FOR SOCIAL SECURITY

BY YUNG-PING CHEN*

In the nature of a progress report, the purpose of this paper is to offer some preliminary answers to the following questions bearing upon the retrospective and prospective views of the relationships of social security taxes and social security benefits:

(1) Do workers gain or lose on their taxes for social security?

(2) As a means of financial protection, is private insurance superior to social security from the standpoint of monetary costs? Or could a worker obtain more benefits from a private insurance contract if he purchases it with the taxes otherwise paid into social security?

(3) How are the relationships of taxes to benefits influenced by considerations of price inflation and productivity gains, especially with references to the future?

In section I, several existing studies of social security "gainers" and "losers" are briefly summarized, with particular emphasis on their approaches and assumptions. A worker is a gainer when he and/or his family have, or will have, received more benefits than what he has contributed. A worker becomes a loser if he and/or his family have, or will have, received less benefits than what he has contributed. In the same section, alternative estimates based on a set of assumptions consistently applied to certain hypothetical workers in different circumstances are presented. In section II, cost comparisons between private insurance and social security are made on the basis of three illustrative workers. In section III, taxes-to-benefits relationships in future years are examined under various assumed conditions regarding price inflation and productivity. Section IV contains some concluding remarks.

I. TAX-BENEFIT RATIO ESTIMATES

The relationships of taxes to benefits under social security have been estimated by various writers. In earlier studies, these relationships were expressed in percentage terms, although the word "ratio" was

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sometimes used. In summarizing these estimates in subsections A and C below, their percentage figures are quoted. However, in the alternative estimates reported in subsections B and D below, taxes-to-benefits relationships are identified as "tax-benefit ratios" for brevity and clarity. These ratios are obtained by dividing the total compounded value of taxes by the total discounted value of benefits, both as of a given year. To compare with other estimates, tax-benefit ratios in tables 1, 2, and 3 need to be multiplied by 100. (See tables 1, 2, and 3 on pp. 73, 74, and 77.)

Gainers in social security are discussed in subsections A and B, and losers in C and D. A worker is a gainer if he has a tax-benefit ratio of less than unity (or smaller than 100 percent in previous studies); the larger the gains, the smaller the ratio. A worker becomes a loser if his tax-benefit ratio is greater than unity (or larger than 100 percent in previous studies); the larger the losses, the larger the ratio.

A. SOCIAL SECURITY GAINERS: SUMMARY OF EXISTING ESTIMATES

With respect to gainers, four sets of computations may be noted. The Social Security Administration has reported two sample studies of the relationship of contributions to benefits.[1] Both samples were chosen by using an account number digital pattern designed to yield a random sample of 100 awards each. Sample No. 1 was selected from benefit awards in August 1960, and No. 2, in September 1962, reflecting different insured requirements. When contributions were accumulated at 3 percent interest and benefits were discounted at the same rate, sample No. 1 showed the value of contributions as a percentage of the value of total benefits to be 5.5 percent for male and 4.1 percent for female beneficiaries. The corresponding figures in sample No. 2 were 8.5 percent and 4.8 percent, respectively. Contributions included only the taxes paid by the employee and those paid by the self-employed. The mortality basis used was the U.S. Life Tables for White Persons, 1949–51.[2] Total benefits included those for old-age,

[1] Robert J. Meyers and Bertram Oppal, "Studies on the Relationship of Contributions to Benefits in Old-Age Benefit Awards," Actuarial note No. 20, Social Security Administration, U.S. Department of Health, Education, and Welfare, June 1965.

[2] According to *Life Tables for 1949–51*, the average number of years of life remaining at age 65 was 13.86 for all whites (12.75 for white males and 15.00 for white females). The following table shows the life expectancies for different groups in the population, as well as improvements in mortality during a period of 10 years. (See the following table:)

AVERAGE NUMBER OF YEARS OF LIFE REMAINING AT AGE 65

Population groups	1949–51 [a]	1959–62 [b]
Total population	13.83	14.39
Total males	12.74	12.95
Total females	14.95	15.80
Total whites	13.86	14.44
White males	12.75	12.97
White females	15.00	15.88
Total nonwhites	13.59	13.96
Nonwhite males	12.75	12.84
Nonwhite females	14.54	15.12

[a] "Life Tables for 1949–51," U.S. Department of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics, vol. 41, No. 1, Nov. 23, 1954, pp. 9, 11, 13, 15, 17, 19, 21, 23, and 25.

[b] "United States Life Tables: 1959–61, U.S. Department of Health, Education, and Welfare, Public Health Service, Public Health Service Publication No. 1252, vol. 1, No. 1, December 1964, pp. 9, 11, 13, 15, 17, 19, 21, 23, and 25.

aged wife, mother, child, potential widow's benefit of aged wife or mother, and lump-sum death benefit, but excluded those arising from potential wife's and widow's benefits of young wives currently ineligible for benefits because of age.

In the same study, if only old-age benefits and lump-sum death payments were considered, the value of contributions (compounded at 3 percent) as a percentage of the value of benefits (discounted at 3 percent) would be 7 percent and 4.1 percent for male and female beneficiaries in sample 1; 9.7 percent for males and 4.8 percent for females in sample 2.

For different categories of persons selected on the basis of their family status and occupation, Elizabeth Deran has presented contribution-to-benefit estimates for imaginary individuals.[3] For the workers whose benefits were influenced by *family status*, their contributions as a percent of benefits ranged from (*a*) 9 percent for a married man age 65 with a never-employed wife age 35 and two children ages 3 and 5, to (*b*) 13 percent for a married man age 65 with a never employed wife age 62 and one child age 15, and to (*c*) 21 percent for either a single man age 65 or a married couple, both age 65 and both of whom had worked. In the group of those whose contributions were affected by *occupation* because of the different dates at which various occupations first came under social security, the percentages ranged from (*a*) 8 percent for a military serviceman with wife never employed, both age 65, to (*b*) 10 percent for a farm worker with wife never employed, both age 65, and to (*c*) 23 percent for a nonfarm self-employed individual.

Miss Deran's figures were computed with the following assumptions: (1) For an employed person, only his or her portion of the social security taxes was considered; for a self-employed individual, the entire social security taxes paid were taken into account; (2) workers always earned at least as much as the maximum taxable earnings; (3) contributions were compounded at 3 percent interest and benefits were discounted at the same rate; (4) contributions were made for 29 years from 1937 through 1965; and (5) benefits were received for 10 years from 1966 to 1975.

Colin D. and Rosemary G. Campbell have also considered the relationship between contributions and benefits.[4] They estimated that these workers retiring in 1967, 1972, 1980 (their respective ages in 1937 being 35, 30, and 22) will all be gainers, for their contributions will last only 2.3, 3.9, and 7 years, respectively. Their estimate also showed that a retirant in 1992 (age 22 in 1949) would about break even, with his contributions a little more than necessary to pay benefits for 14 years.

The following assumptions used by Campbell & Campbell were different from those in other studies: (1) They considered only the old-age benefits, and they used only 80 percent of contributions (that is, allowing 20 percent of contributions as the cost for survivors and

[3] Elizabeth Deran, "Income Redistribution under the Social Security System," *National Tax Journal, vol.* XIX, No. 3, September 1966, pp. 280–283.

[4] Colin D. and Rosemary G. Campbell, "Explanation of Computations of Contributions versus Benefits Under the Federal Old-Age Insurance Program," an unpublished manuscript by courtesy of the authors.

disability benefits); (2) contributions consisted of the combined employee and employer social security taxes; (3) these contributions were compounded at current interest rates (those paid on series E bonds until 1963 and 4 percent thereafter); and (4) benefits consisted of the retirement benefits for the worker *and* his wife.

They compared the accumulated value of contributions of a worker with the amount it required to provide him and his wife retirement benefits for 14 years. If the total value of the taxes he and his employer have paid is not enough to pay the benefits for 14 years, to which he and his wife are entitled, he has had a bargain, or is a gainer. Their approach may be described as one in which the retiree draws on a fund (for example, a bank account) which he has built up with his own as well as with his employer's taxes at compound interest and which continues to earn interest on the declining balance (declining because of withdrawals for annual benefits).

Still another study, that of Henry Aaron, is available.[5] His calculations showed that the social security system of 1962 gave relatively more benefits per dollar of social security taxes to the lower paid worker, and that there was a subsidy to all income levels in the sense that workers received greater benefits than what they had contributed. He used the following assumptions: (1) Social security taxes were paid from 1937 to 1961; (2) social security benefits began in 1962 (the ending date was unspecified in the study); (3) estimates were made for workers who had lived to age 65 (he ignored the possibility of a death before age 65 as well as the possibility of supplementary benefits); (4) the workers bore the full burden of the combined employee-employer taxes (he indicated that alternative assumptions about the incidence of OASDI taxes did not alter the results substantially—this is somewhat surprising to the present writer); (5) arbitrary wage patterns of money wage for each year had a constant real value in 1947–49 dollars of from $500 to $15,000; and (6) two alternate rates of interest, 3 percent and 6 percent, were used.

Under the respective assumptions noted, these several studies have shown that those who have retired, or will retire during the next two to three decades, will have received benefits which are greater than their taxpayments.

B. SOCIAL SECURITY GAINERS: ALTERNATIVE ESTIMATES

Since a variety of assumptions has been used in previous studies, it is difficult to generalize. Broadly speaking, many estimates of tax-benefit relationships have been computed for the worker whose earnings were at least equal to the maximum taxable earnings (later referred to as the maximum earner). With respect to tax contributions, these estimates assumed either no-backward shifting or full-back-

[5] Henry Aaron, "Benefits under the American Social Security System," *Studies in the Economics of Income Maintenance,* Otto Eckstein, ed. (Washington: The Brookings Institution; 1967), pp. 63–67.

ward shifting of the employer portion of social security taxes.[6] On the benefit side, some estimates considered only the combined retirement benefits for the worker and his wife. Finally, tax-benefit relationships have been estimated in current dollar terms with a certain assumed rate of interest for compounding taxes and discounting benefits.

However, (1) the maximum earner is not the typical; the case of the worker whose earnings are near the average taxable earnings (in short, the average earner) needs to be investigated; (2) the assumptions of both no-backward shifting and full-backward shifting of the employer social security taxes are extreme (it would be instructive to consider the possibility of partial-backward shifting); (3) since different family circumstances occasion varying benefit payments, tax-benefit relationships need to be computed for persons of diverse family statuses;[7] and (4) tax-benefit relationships in current dollar terms are significantly altered if they are recomputed in constant dollar terms. When taxpayments and benefits recipients span long periods of time, price inflation becomes a very important consideration. The allowance of price inflation has the effect of raising the rate at which

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[6] The judgment on the shiftability of the employer portion of the social security taxes is a difficult one. While the Social Security Administration (SSA) estimates ignored the employer tax, studies by Campbell & Campbell (C. & C.) assumed that the worker bears the full burden of the employer tax. Since the relationship between taxes and benefits is importantly affected by this assumption, the question warrants some discussion.

Both SSA and C. & C. considered the question of backward shifting in the form of lower wages to the workers—with SSA completely rejecting it and C. & C. fully accepting it. Apparently, neither SSA nor C. & C. entertained the possibility of forward shifting in the form of higher prices. Nor did they discuss the possibility of backward shifting in the form of lower prices to the suppliers of other productive agents.

It is a reasonable assumption that an employer will attempt to shift his taxes onto someone else—either forward to the consumer by means of higher prices, or backward to the worker in the form of reduced wages, or backward to the owner of factors of production, other than labor. In the process of shifting, however, the employer encounters many obstacles in both the product and the factor markets. Given time, it would be comparatively easier for the employer to overcome these interferences. Since workers are consumers, they may bear part of the employer taxes as both employees (in backward shifting) and as consumers (in forward shifting). In the long run, therefore, labor as a group would most likely bear a substantial part of the taxes formerly paid by the employers. To the extent forward shifting occurs, employers themselves will bear part of the burden as well in their capacity as consumers. Moreover, to the extent forward shifting takes place, persons not covered by social security will bear part of the burden of the employer taxes.

While the *exact* extent to which the employer taxes are shifted to the workers remains uncertain, the *exact* amount each individual worker bears the taxes, shifted by his employer, is even more uncertain. Uncertainty arises, because (1) the employer may "overshift" (i.e., passing on more than the taxes he paid) or "undershift" (i.e., passing on less than the taxes he paid); (2) the extent to which workers *qua* consumers bear the burden depends, among other factors, on their individual consumption patterns; and (3) the extent to which workers *qua* employees bear the burden depends on the specific time and place of their employments.

Even though it is impossible to ascertain the precise amount of the employer tax that falls upon the worker, it seems unreasonable to assume that no such shifting takes place. On the other hand, the assumption that the entire amount of the employer taxes is automatically borne by the worker, too, appears stringent. In this study, estimates of tax-benefit relationships are presented with three assumptions concerning the extent to which a worker bears the employer taxes—no-backward shifting, full-backward shifting, and half-backward shifting. Possibly, more than half-backward shifting occurs.

[7] Family statuses are a significant factor in considering tax-benefit relationships. In 1966, out of a total of approximately 3.3 million benefit awards (excluding some 750,000 awards to persons with special age 72 benefits), about one-half of them were awarded to retired workers. Approximately 12 percent of the awards went to wives and husbands, including wife beneficiaries, under age 65 with children in their care, and entitled divorced wives. The remainder, about 38 percent of the total benefit awards, were awarded to children, widowed mothers, widows and widowers, and dependent parents. *Social Security Bulletin,* vol. 30, No. 8, August 1967, p. 32.

taxes are compounded and benefits are discounted.[8] In this section, alternative estimates of tax-benefit relationships that attend to these four considerations, are presented.

Tax-benefit ratios for the maximum earner are shown in table 1, and those for the average earner, in table 2. These workers are assumed to retire in 1966 after 29 years of work, from 1937 to 1965. The column headed "Taxes" lists the three assumptions regarding the shiftability of the employer tax. Ratios based on the no-backward shifting assumption are to be found in the row of figures called "Employee Taxes." Ratios based on the assumption that only one-half of the employer tax is shifted to the employee are registered in the row labeled "Employee Taxes plus 50 percent of Employer Taxes." Ratios based on the assumption of full-backward shifting are located in the row between the above two.

Total taxes are computed by—

$$T=\sum_{i=1}^{m} E_i t_i (1+r)^{m-i}$$

Where T = Sum of the compounded value of taxes paid from January 1, 1937 through December 31, 1965.
E_i = Taxable earnings i^{th} year.
t_i = Combined employee-employer tax rate in i^{th} year.
r = Assumed rate of interest = .03.
i = Index of years = 1, . . . , m.
m = Number of taxpaying years = 29.

These workers are assumed to receive benefits from 1966 to 1979. The columns headed "Benefits" suggest three possible family circumstances, each with different benefit amounts. For example, ratios for the worker who receives his retirement benefits are placed in the column headed "Employees' Retirement Benefits."

Total benefits for these workers are computed by—

$$B=\sum_{j=1}^{n} \frac{b_j}{(1+r)^j}$$

Where B = Sum of the discounted value (to 1965) of the expected benefits from January 1, 1966 through December 31, 1979.
b_j = Annual benefits of j^{th} year, determined by the average of the taxable earnings in the 10 years before retirement.
r = Assumed rate of interest = .03.
j = Index of years = 1, . . . , n.
n = Number of benefit-receiving years = 14.

[8] Price level changes need to be taken into consideration in tax-benefit ratios. With price inflation, the accumulated value of taxes (paid in the early period) may be understated if money magnitudes are used in compounding. Similarly, benefits, which are received in a late period, need to be discounted more, in the face of price inflation. For example, if the interest rate used is 3 percent, and if the price inflation rate is 2 percent, then the rate used in compounding and discounting becomes 5 percent when price inflation is considered. This rate is equal to the highest interest rate that savings and loan associations now offer. Some persons may prefer to use rates higher than 5 percent. Although the results based on higher interest rates are not included in the paper, calculations can easily be performed.

The comparative ratios relative to different earnings bases, to alternative employer tax shifting assumptions, and to various family statuses are shown in the upper half of tables 1 and 2. Some interesting contrasts may be mentioned.

(*a*) Maximum versus average earner: Considering only employee taxes, the maximum earner is estimated to contribute less than 17 percent if he just receives his retirement benefits (a ratio of 0.17); for the average earner, the ratio is about 0.13.

(*b*) Full backward shifting versus half-backward shifting of the employer taxes: Assuming full backward shifting, approximately 33 percent of the maximum earner's retirement benefits come out of his contributions (a ratio of 0.33); if only one-half of his employer's taxes is assumed to have shifted to him, his contributions amount to 25 percent of his benefits (a ratio of 0.25).

(*c*) Employee's retirement benefits versus maximum family payments: Under the assumption of no backward shifting, if he receives only his retirement benefits, the maximum earner contributes less than 17 percent toward his benefits (a ratio of 0.17), but if he has a family eligible for the maximum benefit payments, his contributions amount to about 7 percent (a ratio of 0.07).

The above ratios are based on current dollars. The effect of price inflation is indicated in the ratios in the lower half of tables 1 and 2, where total taxes and total benefits are both calculated in terms of constant dollars.

The formula for the total compounded value of taxes in real terms is—

$$T=\sum_{i=1}^{m} E_i t_i (1+r)^{m-i} (1+p)^{m-i}$$

where the actual Consumer Price Indexes from 1937 to 1965 are used.

The formula for the total discounted value of benefits in real terms is—

$$B=\sum_{j=1}^{n} \frac{bj/(1+p)^j}{(1+r)^j}$$

where the annual rate of price inflation of 2 percent is assumed for 1966 through 1979.

The compounded value of taxes in real terms is greater than the compounded value of taxes in money terms, since the multiplicands in the formula (the taxes) have been enlarged by the rates of price inflation. Therefore, the taxes are being accumulated at a higher rate when taxes in real magnitudes, rather than taxes in money magnitudes, are compounded. The discounted value of benefits in real terms is smaller than the discounted value of benefits in money terms, as the dividends in the formula (the benefits) have been reduced by the rates of price inflation. As a result, the benefits are being discounted at a higher rate when benefits in real terms, as opposed to benefits in money terms, are converted to present values. Consequently, tax-

benefit ratios in constant dollars are approximately 50 percent higher than the ratios in current dollars. For example, the highest ratio of 0.50 (0.33 in current dollar terms) is found for the maximum earner whose contributions include both his own as well as his employer's taxes, but whose benefits are limited to his own retirement benefits. The lowest ratio of 0.11 (as opposed to 0.07 in current dollars) is associated with the maximum earner who is not assumed to bear any of the taxes his employer pays, but who is credited with the maximum family payments.

The following conclusions are supported by the preceding discussion: (1) There are gainers in social security, but depending on earnings levels and family statuses, some gain more than others, with the same assumptions regarding (*a*) the shiftability of the employer's taxes, and (*b*) the rate of interest; and (2) if price inflation is recognized in tax-benefit ratios, the gainers are not gaining as much—in real terms, they contribute about 50 percent more than what they are shown to contribute in current dollars.

It should be realized that the gains belong either to (*a*) persons who have or will have lived to receive retirement or disability benefits, or to (*b*) those who have survivors to be paid benefits. Moreover, these persons will not become gainers unless they have been awarded benefits for a period of time long enough so that their benefit receipts outdistance their taxpayments. Of course, there are always losers either because (*a*) they have not, or will not have, lived to be awarded benefits, (*b*) they do not have survivors to be entitled to payments, or (*c*) they or their survivors have, or will have received benefit payments for a period of time sufficiently short so that their taxpayments outlast their benefit receipts.

C. SOCIAL SECURITY LOSERS: SUMMARY OF EXISTING ESTIMATES

The foregoing estimates have demonstrated that the tax-benefit ratios will be low for the participants in social security who have retired or will have retired in the next 20 years or so. However, the ratios will be high and in some cases very high for those who will be retiring in the more distant future, when estimated taxes and benefits are based on the provisions in the current law. The estimated relationships between contributions and benefits in future years are summarized here.

The Social Security Administration has presented certain calculations of the accumulated value of contributions and the present value of future benefits for various illustrative categories of individuals attaining age 65 in different years from 1962 to 2010.[9] Under the

[9] Estimates of contribution-to-benefit ratios in the future are found in Meyers and Oppal, *op. cit.* Their estimates were based on the provisions of the Social Security Act before the 1965 amendments, and they used zero and 3-percent interest rates for alternative computations. Ray M. Peterson has calculated these ratios to reflect the law as amended in 1965. See his unpublished *Addendum* to Myers and Oppal, *op. cit.*, September 29, 1965. For alternative sets of estimates, Peterson used zero, 3, 3½, and 4 percent interest rates. Some of his figures are cited here.

Social Security Act as amended in 1965, with a 4-percent interest rate, a single male person retiring in 1990 will have a tax-benefit percentage of 104; for a married male retiring in 2010, 43 years from now, the percentage will be 116.

These percentages were calculated on the following assumptions: (1) Worker is alive at age 65 and retires at that time, attaining age 65 at the beginning of the year; (2) worker is an employee at maximum covered earnings in all years after 1937, or after attaining age 20, if later; (3) married worker has a wife the same age, 65; (4) alternative interest rates of 3, 3.5, and 4 percent for compounding contributions and discounting benefits are used; (5) contributions include only the taxes paid by the worker and exclude that portion of his tax for health insurance; and (6) mortality basis is the U.S. Life Tables for White Persons, 1949–51.

Campbell & Campbell also have calculated the relationship of contributions to benefits for different individuals retiring in selected years in the future.[10] They showed that a worker who retires in 1998 will have enough contributions to pay benefits for 19.8 years, whereas he is expected to receive them for only 14 years according to the average life expectancy. A new entrant, age 22 in 1966, retiring in 2009, will have an accumulated fund sufficient for retirement benefits for more than 31 years. Both of these workers are "losers" under social security.

The approach and assumptions used by the Campbells for these estimates are the same as those underlying their calculations for those retiring through 1992, cited in subsection A above. For the convenience of the reader, certain basic assumptions are restated here. Benefits included only those for a man and his wife, and contributions consisted of 80 percent of the total employee and employer taxes. Benefits were discounted at 4 percent interest and the compound interest rate for accumulating contributions was also 4 percent. The comparison of costs and benefits was based on the approach in which the retiree draws on a fund, such as a bank account, which he has accumulated at 4 percent compound interest with the tax dollars he and his employer have paid; he does this in order to pay retirement benefits to his wife as well as to himself, with the declining balance in the fund continuing to earn interest. A retiree is a loser if his fund is not reduced to zero or exhausted at the end of 14 years.

Under the assumptions specified, the general conclusion in these studies is that young workers of today, especially those now joining social security, will have contributed more than that which they may expect to receive in benefits.

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[10] Campbell & Campbell, *op. cit.*

D. SOCIAL SECURITY LOSERS: ALTERNATIVE ESTIMATES

Estimates of the relationships of taxes to benefits for the losers are likewise affected by earnings level, employer tax shiftability, family status, and price inflation. Table 3 contains tax-benefit ratios for the maximum and average earners. The total compounded value of taxes and the total discounted value of benefits are derived from the same formulas as used for the gainers, except that the number of years for tax payments is different.

For present purposes, only case I in table 3 is relevant. Case I ratios are based on the following assumptions: (1) The taxable earnings ceiling will be $6,600, the present level, throughout the contribution period, 43 years; (2) workers' earnings are assumed to remain at the present levels ($6,600 for the maximum earner, and $3,215 for the average earner); (3) benefits will be based on the average of the taxable earnings during the last 10 years of employment, and the benefit formula in the future will be the same as that used at present; (4) benefits will be received for 14 years;[11] and (5) the interest rate is 3 percent for compounding and discounting.

As shown in the table, under the assumption of no-backward shifting, the maximum earner loses when he receives only his retirement benefits (a ratio of 1.16); he gains under other family circumstances. The average earner gains in all situations with the no-backward-shifting assumption, his lowest ratio being 0.45.

If the half-backward-shifting assumption is followed, the maximum earner loses either when he alone receives retirement benefits (a ratio of 1.74) or when he and his wife both receive benefits (a ratio of 1.16). Under the same assumption, the average earner loses only in one situation—when he receives only the retirement benefits, his ratio being 1.35.

Alternatively, when full-backward shifting is assumed, the maximum earner loses even when he is credited with the maximum family payments, but the loss is rather small, with a ratio of 1.05; the average earner loses unless he is entitled to the maximum family payments.

When case I ratios are computed in constant dollars, with an assumed annual rate of price inflation of 2 percent, nearly all ratios exceed unity, the highest being more than 4.50. These ratios are not presented in tabular form.

The foregoing discussion may be summarized: (1) Under the assumptions used in computing tax-benefit ratios in future years, there are still gainers in certain circumstances; (2) there are losers, but some lose more than others, depending upon earnings levels and family status, given the same assumptions on (*a*) the shiftability of the

[11] If life expectancy at age 65, in the future, is more than 14 years as assumed, total benefit payments will be larger, and, therefore, tax-benefit ratios will be lowered. There was some improvement in mortality rates between 1949–51 and 1959–61, as evidenced in the table in footnote 2. Although extrapolation of this trend may not be reasonable, some lengthening of life expectancy may be expected. If so, contributions may need to be increased.

employer taxes, and (*b*) the interest rate; and (3) in constant dollar terms, gainers gain less and losers lose more than is shown in calculations based on current dollars. For the reasons explained previously, this, in effect, means that the higher the rate of interest used in compounding taxes and discounting benefits, the smaller the gains or the greater the losses.

Of course, it should be emphasized that the losers identified in this section refer to the workers who are assumed to pay taxes for 43 years and to receive benefits for 14 years. These workers may become gainers if they pay taxes for a shorter period of time or receive benefits for a longer period of time, with the result that they receive more than they have paid in taxes.

It is true that some workers will have paid into social security more than they may expect to receive in benefits under the assumptions specified above. This phenomenon has been used by some writers to argue that a young worker of today will fare better financially if he uses the tax dollars which he and his employer pay into social security to purchase coverage from a commercial life insurance company. This proposition will be examined in the following section.

TABLE 1.—RATIOS OF TOTAL TAXES (1937–65) TO TOTAL BENEFITS (1966–79)—THE MAXIMUM EARNER

Price level	Taxes	Benefit		
		Employee's retirement benefit	Employee's retirement and wife's benefits	Maximum family payments
Current prices, 1937–65	Employee taxes	0.17	0.11	0.07
	Combined employee-employer taxes	.33	.22	.15
	Employee taxes plus 50 percent of employer taxes.	.25	.17	.11
1965 price	Employee taxes	.25	.17	.11
	Combined employee-employer taxes	.50	.33	.23
	Employee taxes plus 50 percent of employer taxes.	.38	.25	.17

Note: See notes following table 3.

TABLE 2.—RATIOS OF TOTAL TAXES (1937–65) TO TOTAL BENEFITS (1966–79)—THE MAXIMUM EARNER

Price level	Taxes	Benefit		
		Employee's retirement benefit	Employee's retirement and wife's benefits	Maximum family payments
Current prices, 1937–65	Employee taxes	0.13	0.08	0.06
	Combined employee-employer taxes	.25	.17	.13
	Employee taxes plus 50 percent of employer taxes.	.19	.13	.09
1965 price	Employee taxes	.18	.12	.09
	Combined employee-employer taxes	.35	.24	.18
	Employee taxes plus 50 percent of employer taxes.	.26	.18	.13

Note: See notes following table 3.

TABLE 3.—RATIOS OF TOTAL TAXES (1956–2008) TO TOTAL BENEFITS (2009–22) UNDER ALTERNATIVE CONDITIONS: THE MAXIMUM EARNER AND THE AVERAGE EARNER

Worker and taxes	Employee's retirement benefit						Employee's retirement and wife's benefits						Maximum family payments					
	I	II	III	IV	V	VI	I	II	III	IV	V	VI	I	II	III	IV	V	VI
Maximum earner:																		
Employee taxes	1.16	0.69	0.53	0.51	0.39	0.45	0.77	0.46	0.36	0.34	0.26	0.30	0.53	0.32	0.24	0.23	0.18	0.20
Combined employee-employer taxes	2.32	1.39	1.07	1.01	.78	.89	1.55	.93	.71	.67	.52	.60	1.05	.63	.49	.46	.35	.41
Employee taxes plus 50 percent of employer taxes	1.74	1.04	.80	.76	.58	.67	1.16	.69	.53	.51	.39	.45	.79	.47	.36	.34	.27	.31
Average earner:																		
Employee taxes	.90	.52	.40	.39	.30	.35	.60	.35	.27	.26	.20	.23	.45	.26	.20	.20	.15	.17
Combined employee-employer taxes	1.80	1.04	.80	.78	.60	.69	1.20	.70	.54	.52	.40	.46	.90	.52	.40	.39	.30	.35
Employee taxes plus 50 percent of employer taxes	1.35	.78	.60	.59	.45	.52	.90	.52	.40	.39	.30	.35	.67	.39	.30	.29	.23	.26

NOTES TO TABLES 1, 2, AND 3

1. The maximum earner is the worker whose earnings are at least equal to the maximum taxable earnings. The average earner is the worker whose earnings are at the level of the average taxable earnings. Calculations in tables 1 and 2 assume tax payments for 29 years and benefit receipts for 14 years. Calculations in table 3 assume tax payments for 43 years and benefit receipts for 14 years.

2. Tax-benefit ratios are obtained by dividing the total compounded value of taxes by the total discounted value of benefits. To illustrate, the ratio is 0.5 when the discounted value of benefits is twice as much as the compounded value of taxes; the ratio is 2 when the compounded value of taxes is twice as much as the discounted value of benefits.

3. Formulas for computing the total compounded value of taxes and total discounted value of benefits are explained in the text. The benchmark year for compounding and discounting in tables 1 and 2 is 1965; in table 3, it is the year 2008.

4. Tax-benefit ratios in table 3 for the 6 cases (I through VI) are computed according to the conditions listed in the table at end of notes.

5. Maximum taxable earnings in cases II and III are assumed to be changed every 10 years. Projections of the maximum taxable earnings in future years are based on the relation between average taxable earnings and maximum taxable earnings from 1937 to 1965. The data on the average taxable earnings in past years were provided by the Office of the Actuary, Social Security Administration, letter to the author, Apr. 7, 1967. Average taxable earnings after 1966 are assumed to increase at 3 percent per year.

6. The annual rate of increase in cases III and V (4.2 percent) is the average rate of increase in benefit payments to the retired worker from 1940 to 1956, computed from "Average Monthly Benefit Amount in Current Payment Status for the Selected Types of Beneficiaries, in Actual and Constant Dollars, Dec. 1940–66," a table provided by Dr. Benjamin Bridges, Jr., Division of Research and Statistics, Social Security Administration, April 1967.

See the following table referred to in note 4.

ALTERNATIVE CONDITIONS AFFECTING TAX-BENEFIT RATIOS IN TABLE 3

Item	Case					
	I	II	III	IV	V	VI
Maximum taxable earnings.	1966–2008, $6,600	1966–75, $6,600; 1976–85, $9,000; 1986–95, $12,000; 1996–2005, $16,000; 2006–8, $20,000.	Same as in II	1966, $6,600; increasing at 5 percent per annum.	Same as in IV	Same as in IV.
Worker's earnings	$6,600, 1966–2008 (maximum earner); $3,215, 1966–2008 (average earner).	1966, $6,600 (maximum earner); $3,215 (average earner), both increasing at 3 percent per annum.	do	1966, $6,600 (maximum earner); $3,215 (average earner), both increasing at 5 percent per annum.	do	Do.
Benefit computation formula.	Annual benefits are based on the average of the taxable earnings in the last 10 years of employment (1999–2008). The benefit formula is: (a) 62.97 percent of the first $1,320 of annual earnings. (b) 22.90 percent of the annual earnings between $1,320 and $4,800. (c) 21.40 percent of annual earnings over $4,800 up to $6,600. Under this formula, the primary insurance amount (PIA) as a ratio to the average taxable earnings (ATE) for the maximum earner is approximately 30 percent; for the average earner, it is about 39 percent.	Annual benefits are based on the average of the taxable earnings in the last 10 years (1999–2008). PIA as percent of ATE for the maximum and average earners are the same as in I.	Benefit in the first year (2009) is the same as in II. Benefits in later years are assumed to increase at 4.2 percent per annum.	Annual benefits are based on the average of the taxable earnings in the last 10 years (1999–2008). PIA as percent of ATE for the maximum and average earners are the same as in I.	Benefit in the first year is the same as in IV. Benefits in later years are assumed to increase at 4.2 percent per annum.	Benefit in the first year is the same as in IV. Benefits in later years are assumed to increase at 2 percent per annum, which is the assumed annual rate of price inflation.
Combined employee-employer tax rates.	1966, 7.7 percent; 1967–68, 7.8 percent; 1969–72; 8.8 percent; 1973–2008, 9.7 percent.	Same as in I	Same as in I	Same as in I	Same as in I	Same as in I.

II. Social Security vs. Private Insurance: Comparative Cost

In order to examine the proposition that a young worker of today will receive more financial protection if he purchases private insurance with the tax dollars he and his employer are paying into social security,[12] it is necessary to compare these two methods in terms of the comparative cost for the same benefits. Putting aside health benefits, social security provides (1) old-age, (2) survivors, and (3) disability benefits in a single package. Since no private insurance carrier offers an equivalent policy, precise comparisons are most difficult. There are those who would argue that it is well-nigh impossible to make such comparisons because of both the large number of parameters involved and the large degree of variations in the types of policies offered by private insurers. For the present purpose, however, it is imperative that an attempt be made to offer as nearly accurate a comparison as possible, and that the cost comparison be done with respect to the three types of benefits *as a whole.*

With the aid of actuaries in and out of the insurance industry, several sets of estimates have been obtained on the premiums required by commercial insurance carriers for providing the benefits that social security offers. These estimates represent the rates used for both participating and nonparticipating policies by as many as seven insurance companies. Although it is reassuring that several of them come very close to one another, these estimates are merely *suggestive* in nature, and they serve to indicate the range of premiums that an insurance company would probably charge. It should be emphasized that much care has been taken to assure that the premium rates quoted are those necessary for providing the benefits that are virtually equivalent to those available under social security. As a consequence, some of the rates incorporated in the range of premiums reported below are not those for the policies currently available; rather, these rates are for the policies that are designed to provide benefits nearly identical to those under social security.

For purposes of appraising the value of potential survivors and disability benefits in addition to retirement benefits, the estimates are provided for three hypothetical workers, A, B, and C. For ease of identification, their characteristics are listed in tabular form as follows:

Worker	Earnings in 1966 and thereafter	Age in 1966	Age of—		
			Wife	Children	
				No. 1	No. 2
A	$1,800	22	22	2	1
B	3,000	22	22	2	1
C	6,600	22	22	2	1

[12] This proposition has been supported by the computations of the cost for retirement benefits under social security, after deducting 20 percent of the combined employee-employer social security taxes. Twenty percent of the combined taxes are treated as the cost for the provision of survivors benefits and disability benefits under social security. See Colin D. and Rosemary G. Campbell, "You'll Never Get Back All Those Old-Age 'Contributions'," *Washington Post,* Nov. 7, 1965, p. E–3, and also, James M. Buchanan and Colin D. Campbell, "Voluntary Social Security," *Wall Street Journal,* Dec. 20, 1966, p. 14.

In the cost comparison in subsections A through E, it is assumed that the worker will have at his disposal the full amount he and his employer are paying into social security, if he decides to purchase private insurance coverage instead. Subsection F briefly indicates the comparative figures under alternative assumptions concerning whether the employer contribution to social security will be available to the employee.

Presented here are the comparative costs for survivors benefits, disability benefits, and retirement benefits, first separately and then combined. Given minor variations, survivors benefits are provided for by a family income policy based on decreasing term insurance; disability benefits are provided for by a disability income policy with a 180-day waiting period; and retirement benefits, by a no-refund retirement annuity contract.

A. SURVIVORS BENEFITS

In the case of the worker's death, the annual benefits expected of social security under the 1965 law are shown below, followed by the range of annual premiums which an insurance company would probably charge for the same benefits.

Year	Worker A	Worker B	Worker C
1968–82	$1,440.00	$2,428.80	$4,416.00
1983–85	1,408.80	1,831.20	3,024.00
1986	704.40	915.60	1,512.00
2006–life	775.20	1,006.80	1,663.20
Lump-sum death payments	234.60	255.00	255.00

ANNUAL PREMIUMS (FOR SURVIVORS BENEFITS)

Worker	1968–82	1983–85	1986	1987–2008
A	$100–$130	$100–$130	$50–$70	$60–$80
B	145– 180	125– 155	65– 95	75– 100
C	240– 300	200– 260	100–140	110–150

The basic assumptions regarding the expected social security benefits are—

(*a*) 75 percent of the primary insurance amount (PIA) for each child until age 22, assuming school attendance.

(*b*) 75 percent of PIA for the mother until the youngest child attains age 18.

(*c*) 82½ percent of PIA for the mother who resumes benefit at age 62, assuming no remarriage.

(*d*) The private insurance policy would not be issued until age 24 (1968), because social security requires 6 quarters of coverage before benefit payments commence.

(*e*) In the private insurance policy, no provision is made for children's benefits beyond age 18 if the child were disabled before age 18 and the disability continued beyond that age.

B. DISABILITY BENEFITS

For the (equivalent) benefits provided under the 1965 social security law in case the worker becomes disabled before age 65, the annual disability benefits and the range of annual premiums which an insurance carrier would probably charge are as follows:

ANNUAL DISABILITY BENEFITS (SUBJECT TO THE "MAXIMUM FAMILY PAYMENT" LIMITATION)

Year	Worker A	Worker B	Worker C
1971 to 1982	$1,440.00	$2,428.80	$4,416.00
1983 to 1985	1,440.00	2,428.80	4,032.00
1986	1,407.60	1,830.60	3,024.00
1987 to 2008	938.40	1,220.40	2,016.00

ANNUAL PREMIUMS (FOR DISABILITY BENEFITS)

[These premiums are for those occupations eligible for the lowest rates] [1]

Worker	1971–82	1983–85	1986	1987–2008
A	$30–$40	$30–$40	$30–$40	$20–$30
B	45– 70	45– 70	40– 50	30– 40
C	75–125	70–115	60– 90	45– 60

[1] These premium rates are those available to the workers in occupations, such as executive positions, office work, teaching, merchandising, and the like, which involve small chances of hazards. Such occupations are identified in the insurance industry as class AAA or class A–1 or similar designations. Higher rates are charged the insured when they are in class AA or class A–2 occupations, such as physicians, dentists, surgeons, factory superintendents, foremen, etc. Still higher rates are charged the insured who are classified in class A or A–3 occupations—auto mechanics, butchers, carpenters, bus or taxi drivers, etc. There are further classifications such as class B or class A–4. It suffices at this time to point out some differential rates. The current premium rates charged by 1 insurance company for the same disability benefits quoted in the text for worker C (with annual earnings of $6,600) during 1971–82 follow:

Class AAA	$128
Class AA	145
Class A	176

It can be seen that a class AA worker will pay almost 15 percent (and a class A worker, nearly 40 percent) more than a class AAA worker. Moreover, there are the class M or class "No" workers who cannot purchase coverage from a private insurer

The basic underlying assumptions concerning the expected benefits are—

(*a*) PIA for the worker to age 65.

(*b*) 50 percent of PIA for each child until age 22, assuming school attendance.

(*c*) 50 percent of PIA for the mother until the youngest child attains age 18.

(*d*) The cost for the resumption of the mother's benefits later as a widow's benefit is *not* included in the cost for disability protection. Rather, the cost of widow's benefits is included in the retirement benefits below.

(*e*) The private insurance policy would not be issued until age 27 (1971), because eligibility for social security requires 20 quarters of coverage in the 40 quarters preceding the date of disability.

C. COMPARISON OF COSTS FOR SURVIVORS AND DISABILITY BENEFITS

Since the number of years in which taxes for social security and premiums for private insurance differs, total taxes and total premiums are calculated on the basis of present values so as to reduce them to a

comparable basis. In this study, 30 percent of the combined taxes paid by the worker and his employer are assumed to be the contribution to social security for these two benefits.[13]

PRESENT VALUES OF PREMIUMS AND TAXES AT 3 PERCENT INTEREST (FOR SURVIVORS AND DISABILITY BENEFITS)

Worker	Private insurance	Social security
A	$2,500–$3,000	$1,250
B	3,500–4,200	2,100
C	5,700–7,400	4,600

These comparative figures suggest that it would cost these hypothetical workers *more* to purchase coverage for survivors and disability benefits from a private insurer than that which they and their employers are required to pay for the similar benefits under social security. The figures also suggest that the cost advantage to worker A, whose earnings are the lowest of the three, is greater than the advantage to worker B, who in turn, is in a more advantageous position than worker C who has the highest earnings of the three. Even worker C is shown to pay substantially more than what he is expected to pay into social security.

No analysis of disability benefits should be concluded without indicating that not all occupations are insurable by private insurance, and among the insurable, premiums for the same benefits differ among occupational classes. (See footnote 1 to table.)

D. OLD-AGE RETIREMENT BENEFITS

For the annual retirement benefits for a worker and his wife ($1,407.60 for worker A; $1,830.80 for worker B; and $3,024 for worker C),[14] the range of insurance premiums charged by an insurance company would probably be as follows:

Worker	Annual premium	Present values of premiums and taxes at 3 percent interest (for retirement benefits)	
		Private insurance	Social security
A	$120–$180	$2,700–$3,000	$2,960
B	150–230	3,800–5,200	4,900
C	250–375	6,300–8,500	10,800

[13] Although 20 percent of the social security taxes paid by the employee and his employer have been assumed to represent the cost for survivors and disability benefits, recent calculations by the Social Security Administration suggest a 28.3 percent figure. This figure is based on an example of a male worker who enters covered employment at a young age, when the ultimate contribution rate is in effect with 1966 average taxable earnings. Myers indicates that the results of such a calculation are not absolute, but, rather, they will vary, depending upon a composite of many factors, such as the assumptions made with respect to interest rates, mortality rates, estimated average earnings, etc. Robert J. Myers, *Letter* to the author, June 26, 1967. The present study uses 30 percent for approximation and ease of calculation.

[14] These amounts are 150 percent of the primary insurance amounts (PIA) due each worker, since the wife is entitled to 50 percent of the PIA. Therefore, if the worker is alone to receive the benefits, only two-thirds of the amount indicated are paid to him (i.e., the PIA.) However, if the wife of the worker is alone to receive the benefits (as a widow), 82.5 percent of the PIA are paid to her.

In terms of retirement benefits, workers A and B would probably do as well under either system, but worker C suffers a cost disadvantage.

E. COMPARISON OF COSTS FOR SURVIVORS, DISABILITY, AND RETIREMENT BENEFITS

In order to compare the entire package of coverage, the total of social security taxes and of private insurance premiums should be considered.

Worker	Present values of premiums and taxes at 3 percent interest (for all 3 benefits)	
	Private insurance [1]	Social security
A	$5,300–$6,000	$4,210
B	7,900–8,700	7,000
C	13,200–14,200	15,400

[1] The totals in the column are not equal to the summation of the figures quoted for the separate policies, because a company's rates may be low on one policy while high on another.

When the three benefits are taken together as a package, worker A enjoys a distinct cost advantage, and worker B, a somewhat smaller cost advantage. The cost advantage in both cases is enhanced by the tax-free treatment of social security benefits. On the other hand, worker C experiences a cost disadvantage, but this is reduced since social security benefits are nontaxable. Further, worker C might even enjoy a cost advantage if he is employed in an occupation that would occasion higher insurance premiums from a commercial insurer.

The foregoing computations and observations may now be summarized. (*a*) With respect to suvivors benefits and disability benefits, there seems to be a distinct cost advantage in social security vis-a-vis private insurance for the three hypothetical workers, A, B, and C, with the assumed age, earnings, and family circumstances. (*b*) As for retirement benefits alone, workers A and B appear to do as well in terms of comparative cost for coverage either under social security or private insurance, while worker C suffers a cost disadvantage. (*c*) Taking the package of all three benefits, social security is shown to offer a cost advantage to Workers A and B and to present worker C with a cost disadvantage. (*d*) The tax-free nature of social security benefits increases the cost advantage to workers A and B, and lowers the cost disadvantage to worker C. And (*e*) even worker C may not suffer the cost disadvantage if he is required to pay higher premiums than those assumed in the computations for disability benefit coverage from private insurance. (See footnote 1 to table.)

F. ALTERNATIVE ASSUMPTIONS ABOUT THE EMPLOYER CONTRIBUTION

One of the important assumptions upon which the above conclusions are based is that, when a worker buys private insurance, he will have the funds from his employer who now contributes them to social security. In other words, implicit in these comparisons is the full-backward-shifting assumption regarding the social security taxes paid by

the employer. Under the alternative assumptions, those of no-backward shifting and half-backward shifting, different conclusions as to the relative cost emerge, as shown in the following table:

Worker	Present values of premiums and taxes at 3 percent interest (for all 3 benefits)			
	Private insurance	Social security		
		No-backward shifting	Full-backward shifting	Half-backward shifting
A	$5,300–$6,000	$2,105	$4,210	$3,150
B	7,900–8,700	3,500	7,000	5,250
C	13,200–14,200	7,700	15,400	11,550

It can be readily appreciated that worker C begins to encounter a cost disadvantage when more than 75 percent of his employer's taxes are shifted to him.

G. CERTAIN LIMITATIONS ON COST COMPARISONS

Cost comparisons between social security and private insurance should not be performed without the recognition of certain limitations, several of which may be noted. (*a*) Single men and single women pay the same social security taxes as do married persons; the taxes do not differ as between those married persons with dependents and those without dependents; and the taxes are the same regardless of the number of dependents. Taxes vary between and among individuals only as their earnings differ, up to the maximum taxable earnings. If the above categories of persons' earnings from employment are the same, they pay the same taxes, but they are entitled to different amounts of benefits. (*b*) A self-employed person pays 50 percent more in taxes than the employee portion of the social security taxes that an employed worker pays. If their earnings and family circumstances are identical, their benefits will not differ. (*c*) A working wife, who contributes toward social security just as anyone else, may not increase her benefit, because no one individual can receive the full amount of more than one type of benefit. (*d*) To be "fully insured" under social security, a worker, attaining age 65 in 1991 or later, needs 10 years or 40 quarters of work covered by social security; to be "currently insured," a worker needs at least 1½ year's covered employment within the 3 years before death or retirement; and to be eligible for disability benefits, a worker must be fully insured, and 5 years of his work must have been in a 10-year period ending when he becomes disabled. So long as a worker satisfies these conditions, he is entitled to the benefit payments under the law. On the other hand, continuity of payment of private insurance premiums for the periods of time specified in the comparison above is necessary if benefits will be payable. (*e*) Some persons continue to work after age 65 and thus pay social security taxes, but their benefits are not thereby increased when they retire. The earnings test before age 72 reduces benefits to some persons and eliminates other individuals from receiving benefits, but there is no such limitation in a private insurance policy. (*f*) Private isurance premiums include underwriting costs, and private insurance mortality and disability rates are developed from insured lives,

whereas social security has no such underwriting costs (other than administrative costs) and uses population experience. (*g*) The premium rates reported in subsection E for all three benefits combined were obtained from the rates for the three policies separately. To the extent that there is any cost reduction when the three policies are written at the same time for an individual, the private insurance cost estimates used in the comparison would appear overstated. And (*h*) the observations on comparative cost between social security and private insurance reported in this section are for the three hypothetical workers with the explicit and implicit assumptions regarding age, family composition, earnings levels, and other relevant factors. Care should be taken in generalizing their cost positions for all other individuals. The sole purpose of this exercise is to use these comparative figures to suggest that it is misleading to consider a certain type of person covered by social security and then to permit the inference that it applies to very many cases. One can easily "prove" social security to be a losing proposition if one uses the example of a "confirmed bachelor" or a "confirmed couple" (i.e., a couple determined not to raise a family), or a person who knows he will be employed continuously (or even a person who knows he will not be disabled). On the other hand, social security can be shown in a much more favorable cost position under certain other cases.

III. Tax-Benefit Ratios in the Future: Several Possibilities

In section I, social security gains and losses were discussed. The losers, there identified with respect to the future, represented the results of but one set of possibilities, based on rather strict and artificial assumptions. Unrealistic though they may seem, these ratios are not meaningless, for they reflect the provisions of the existing law. However, since the present law is virtually certain to change, these estimated ratios are of doubtful predictive value. With these ratios as a point of departure, explored below are five other possibilities on the basis of alternative assumptions regarding the maximum taxable earnings, worker's earnings, and the benefit formula. The tax rates used in all cases, I through VI, are those in effect now and those scheduled in the present law for future years.

A. "Unvarying" versus "Increasing" Assumptions

Case I is based on what may be called unvarying assumptions. To repeat, it assumes that the maximum taxable earnings will be $6,600 in the future as at present, that the worker's earnings will remain at their present levels (the so-called level-earnings assumptions), and that the benefit formula in 1965 will prevail in future years. These are unrealistic assumptions and tax-benefit ratios based on them could be misleading as a projection of what is likely to happen in the future.

Although the long-range cost estimates (for a period of 75 years) prepared by the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds assume that the maximum taxable earnings, the average total earnings of covered workers, and benefit provisions all remain unchanged, the Board has

customarily provided in its recent annual reports two sets of medium-range projections (for about 15 to 20 years) by means of alternative assumptions.[15] While one projection assumes that the provisions of the current law will be in effect in the future, the other projection assumes that the maximum taxable earnings and benefit provisions are amended periodically so that the relationships among total earnings, taxable earnings, and benefit expenditures during the period in question are the same as those shown in the long-range intermediate-cost estimates prepared on level-earnings assumptions. For both projections, average total earnings of covered workers is assumed to rise at an annual rate of 3 percent.

The assumptions underlying the second projection are more realistic and hence more meaningful. Case II is illustrative of how tax-benefit ratios would be affected by rising earnings and rising maximum taxable earnings base. Case II assumes that the maximum taxable earnings will be adjusted upward at 10-year intervals (see notes to tables 1, 2, and 3) and the worker's earnings will increase at a rate of 3 percent annually. As for the benefit provisions, case II uses the same benefit structure as determined by the benefit formula now in the present law. Specifically, under existing provisions, the primary insurance amount of the maximum earner is a little over 30 percent of the average of his taxable earnings in the last 10 years of employment; for the average earner, it is approximately 39 percent. These percentages serve the basis for benefit computations in case II.

As shown in table 3, tax-benefit ratios in case II are all lower than those in case I—the ratios in case I are reduced by about 40 percent. In case II, the ratio exceeds unity for the maximum earner only under two circumstances, and all but one of the ratios for the average earner are less than unity.

From 1940 to 1966, benefit payments to the retired worker had been increased at an average annual rate of 4.2 percent.[16] In light of this historical record, it would be of interest to appreciate the effects on tax-benefit ratios of *changing* benefit formula *without altering* the conditions of the maximum taxable earnings and the worker's earnings as assumed in case II. Case III, in which benefit payments are increased annually by 4.2 percent, is set up for such a purpose. As shown in table 3, the tax-benefit ratios in case III are all lower than those in case II. As compared with the ratios in case I, the ratios in case III are more than 50 percent less. The maximum earner loses only in one case, having a ratio of 1.07, whereas the average earner loses in none.

B. "INCREASING" ASSUMPTIONS: 3 PERCENT VERSUS 5 PERCENT

Although the annual growth rate of 3 percent for earnings assumed in cases II and III is more realistic than the level-earnings assumptions in case I, the projected gain in earnings may fall short of what may actually take place. If earnings are assumed to rise by the annual gain in productivity of 3 percent and, in addition, by the annual rise

[15] For example, see the 1967 *Annual Report*, Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds (mimeographed).

[16] See notes to tables 1, 2, and 3. H.R. 5710 is currently under consideration in the U.S. Congress. This bill proposes, among other things, an average increase of 20 percent in benefit payments.

in the price level of 2 percent, a growth rate of earnings at 5 percent per annum may be speculated. With respect to the maximum taxable earnings, a continuous upward adjustment of 5 percent per year may also be contemplated.

The assumption of a 5-percent annual rate of increase in money wages does not appear unreasonable in light of the record in the post-war period. From 1947 to 1965, the average annual rate of gain in output per man-hour in the private economy was 3.2 percent. During the same period, the compensation per man-hour in current dollars rose by an average annual rate of 5 percent (a 3.2-percent rise in real terms).[17] In a recent study of the potential and problems of economic growth in the United States to 1975, the Joint Economic Committee uses two sets of assumptions. For the A model, (1) productivity in the private sector is assumed to advance at 3.5 percent per year from 1966 to 1970 and at 3.1 percent annually from 1970 to 1975, and (2) price level is assumed to rise at an annual rate of 2 percent from 1966 to 1975. For the B model, (1) the annual growth rate of productivity is assumed to be about 3 percent throughout the entire period, and (2) the rate of price inflation is assumed to be 1.5 percent per year. Wage rates in both the public and private economy are assumed to rise by the sum of the annual rates of gain in productivity and in consumer prices. In other words, wage rates in the A model will rise at 5.5 percent annual rate from 1966 to 1970 and at 5.1 percent from 1970 to 1975, and they will increase in the B model by 4.5 percent per annum for the entire period, 1966 through 1975.[18]

The effects on tax-benefit ratios when worker's earnings and the maximum taxable earnings are both rising at 5 percent instead of at 3 percent per year are illustrated by the ratios in case IV. All ratios except one are less than unity for the average earner as well as for the maximum earner. The highest ratio for the maximum earner is 1.01; for the average earner, it is 0.78.

Analogous to case III, case V may be considered. This is a case in which maximum taxable earnings and worker's earnings are both rising at 5 percent per annum, but benefit payments are assumed to increase at an annual rate of 4.2 percent. As expected, tax-benefit ratios in this case are lower than those in case IV. The highest ratios for the maximum and for the average earners are 0.78 and 0.60, respectively.

C. INFLATION PROOF SOCIAL SECURITY

Fixed dollar income shrinks in purchasing power during times of price inflation. Social security systems the world over have attempted to adjust their benefits in the face of inflation. In addition, the benefit computation formula itself has been changed over time. The mecha-

[17] See table 11 in *The Economic Situation in 1966,* Statement submitted to the Joint Economic Committee, U.S. Cong., by Arthur M. Ross, *Hearings on the 1966 Economic Report of the President,* Feb. 8, 1966 (mimeographed).

[18] *U.S. Economic Growth to 1975: Potential and Problems,* Joint Economic Committee, U.S. Congress, 89th Cong., 2d sess. (Washington: D.C., Government Printing Office: 1966, p. 8). It should be mentioned that lower rates of productivity gain and price level advance have also been used in projections. The National Industrial Conference Board assumes for the total economy an annual growth rate of productivity at 2.85 percent to 1975 and an annual price inflation rate of 1.2 percent to 1975. "The Economy in the Next Decade." *The Conference Board Record,* vol. II, No. 12, December 1965, pp. 3–23, esp. pp. 9 and 10.

nisms by which these adjustments are made, however, are different. In some countries, adjustments are provided for by means of a price index (and/or wage index), under which changes in benefit amounts come about automatically. In other countries, adjustments are made by an ad hoc procedure, usually in the form of a legislative decree. Both methods have their advantages and disadvantages.[19]

Cases III and V, discussed previously, are illustrative of the effects on tax-benefit ratios when rises in benefits contain both allowance for inflation and additional increase in benefits. In the context of the present discussion, it would be of interest to appraise the effects on tax-benefit ratios of a system in which social security benefits are continuously and automatically adjusted for price inflation. Case VI assumes that the maximum taxable earnings and the worker's earnings both rise at 5 percent per annum, and that benefit amounts are raised annually in accordance with the assumed rate of advance in the general price level of 2 percent.

Table 3 shows that tax-benefit ratios in case VI are higher than those in case V but lower than those in case IV. None of the ratios are in excess of unity either for the maximum earner (with the highest ratio of 0.89) or for the average earner (his highest ratio being 0.69).

IV. Concluding Remarks

The highlights of this paper are as follows: (1) There are gainers and losers in social security. The extent of gains and losses depends critically upon assumptions regarding earnings levels, family statuses, the shiftability of the employer taxes, and the factor of price inflation.[20] (2) Consideration of price inflation in tax-benefit ratios has the effect of raising the rate at which taxes are compounded and benefits discounted. (3) Cost comparisons between private insurance and social security suggest that a worker with high earnings (annual

[19] The most up-to-date descriptions of the social security systems in the world are available in *Social Security Programs Throughout the World, 1967*, Social Security Administration, U.S. Department of Health, Education, and Welfare (Washington: U.S. Government Printing Office; 1967, 239 pp). Many social security systems provide for automatic adjustment of benefits to compensate for inflation. Daniel S. Gerig, "Automatic Cost-of-Living Adjustment of Pensions in Foreign Countries," *Social Security Bulletin*, vol. 23, No. 3, March 1960, pp. 16–19, 24). In the United States, two Federal retirement systems adjust their benefits in accordance with the rate of inflation. John P. Jones, "Amendments to the Civil Service Retirement Act," *Social Security Bulletin*, vol. 26, No. 2, February 1963, pp. 12–16; and Marice C. Hart, "Cost-of-Living Increases in Military Retired Pay," *Social Security Bulletin*, vol. 27, No. 2, February 1964, pp. 13–14.

For a discussion of different methods of benefit adjustments, see Robert J. Myers, "The Effect of Dynamic Economic Conditions on a Static-Provision National Pension Scheme," *Transactions*, 17th International Congress of Actuaries, London and Edinburgh, England, May 1964, pp. 328–336, especially 335–336.

[20] Participants in social security gain only at the expense of others, including largely those also in the program, and partly, those who are not included in the program (if covered workers bear less than the full burden of the employer tax). With respect to covered workers, the direction of income transfer is (*a*) *from* those with higher earnings (up to the taxable ceilings) *to* those earning less, due to benefit weighting in favor of the latter, (*b*) *from* workers who receive little or no benefits *to* those who receive or who are credited with large amounts of benefits (because of differential mortality rates or by reason of family circumstances), (*c*) *from* long-term members *to* those in the program for shorter periods of time (but still long enough to be entitled to benefits), either due to differences in the work history of individuals or to different dates from which their occupations have been covered, (*d*) *from* both of those workers who have not worked long enough to gain eligibility and those married women workers who do not receive benefits on their own contributions *to* those workers who meet eligibility requirements, and finally, (*e*) *from* employed workers *to* the self-employed on assumption of full-backward shifting.

In view of the differential mortality experiences of the various groups in the population, cited in footnote 2, Negro workers may more often lose under social security due to lower life expectancies. However, this "disadvantage" may be offset by the provisions of survivors and disability benefits which favor both families with large numbers and persons more prone to being disabled.

wages of $6,600 in the hypothetical case) may be disadvantaged in the sense that he may be required to pay more for social security than that which private insurance might require of him for the same benefits. However, there are circumstances under which even he may not suffer a cost disadvantage. In contrast, workers of lesser earnings (annual wages of $1,800 and $3,000 in the examples) seem to enjoy a cost advantage in social security vis-a-vis private insurance. It should be pointed out that comparisons are based on monetary costs. Not treated in the study are the costs associated with compulsion under social security and those associated with seeking information for private insurance coverage. (4) Case I is based on unrealistic assumptions, but these are used in most currently available analyses. Case II assumptions are most realistic, judging from the history of changing provisions in the past. The assumption of benefit increase at the historical annual average of 4.2 percent in cases III and V may be questionable, but some increase in benefit payments seems reasonable to speculate. In cases IV, V, VI, the realization of the assumption of continuously rising maximum taxable earnings (in accordance with the rise in worker's earnings) would require a substantial departure from current practice; this same requirement would apply to the assumption of automatically adjusting benefit payments to make up for the loss of purchasing power due to price inflation. (5) If price-level increases and productivity advances are reflected in setting taxes and benefits, tax-benefit ratios in the future will be substantially lower than those computed on the basis of the provisions in the current law. (6) If automatic adjustment is provided, so as to maintain the purchasing power of a given amount of benefits during the receipt period, tax-benefit ratios are shown to be favorable in case VI in which taxes rise as workers' earnings and maximum taxable earnings both increase. And (7) the focus of the paper has been on the tax-benefit relationships insofar as individual workers are concerned.

THE REAL RATE OF INTEREST ON LIFETIME CONTRIBUTIONS TOWARD RETIREMENT UNDER SOCIAL SECURITY

BY JOHN A. BRITTAIN*

The fifteenfold growth of Federal social security tax receipts since 1949 has stirred a debate over how well workers fare under the system. The expressed opinions are remarkably varied. For example, Paul Samuelson pictures a growing nation as "the greatest Ponzi game ever contrived," with its growth making possible ever-expanding social security benefits:

> The beauty about social insurance is that it is *actuarially* unsound. Everyone who reaches retirement age is given benefit privileges that far exceed anything he has paid in. And exceed his payments by more than 10 times as much (or five times, counting in employer payments.)[1]

On the other hand Milton Friedman speaks of a "raw deal" for young workers:

> Retired persons currently enjoy a bonanza. But youngsters currently entering the system are getting a raw deal. * * * To finance the excess payments to the growing number of retired, taxes have had to be raised repeatedly. As a result the benefits promised younger workers are much smaller than the equivalent of the taxes paid on their wages.[2]

These disparate opinions invite a review of the arguments and a systematic evaluation of the evidence. However, the stress here will be on the real rate of interest or return on contributions under the system, rather than on the lifetime tax-benefit ratios referred to by Samuelson and Friedman. Projections by means of an abstract model suggest that even under a variety of assumptions the prospective return to most new participants under social security is far less attractive than indicated by Samuelson, but better than the "raw deal" suggested by Friedman. In particular it will be argued that most

*The writer is a member of the Senior Staff at The Brookings Institution. The issue considered here arose within a general study of the economic effects of payroll taxation under a program supervised by the National Committee on Government Finance and financed by a special grant from the Ford Foundation. Helpful suggestions were offered by Henry Aaron, William Birdsall, John Carroll, Henry Cassidy, Ida Merriam, Robert Myers, Michael Taussig, and Joseph Pechman. However, the views expressed here are those of the writer alone. Thanks are due Sheau-Eng Lau for invaluable research assistance.

[1] "On Social Security," *Newsweek*, Jan. 13, 1967, p. 88.
[2] Milton Friedman, "On Social Security," *Newsweek*, Apr. 3, 1967, p. 81.

participants will fare much better than investors in fixed dollar claims have in recent recades, but much less well than long-run investors in equity capital.[3]

A. Some Issues in the Controversy

Before turning to the evidence, it should be acknowledged that estimation of lifetime tax-benefit ratios for individuals is a somewhat artificial exercise in the first place. Why should we ask whether a person ultimately recoups in benefits the equivalent of his taxes when the same question is rarely asked with respect to other taxes? The essence of the social security system is that it is a current transfer program under which the working generation pays taxes to finance benefits to others who have retired. Since the taxes and later benefits assigned to an individual are not related at all closely as they are under private insurance, a strong case can be made for completely separate analysis and evaluation of the tax and benefit structures on their own merits. Certainly the present existence of a very tenuous relationship between individual taxes and benefits does not exempt the payroll tax itself from the criticism that it is regressive and a heavy burden on low-income groups.

Despite these methodological considerations, the question of the attractiveness of social security to individuals has already been recognized for debate, and it is tempting to be diverted to the issue. Part of the temptation is due to the explicit earmarking of the tax for provision of benefits. Furthermore, participants in the system have been encouraged to believe that they are "paying for" their benefits individually, and many appear to believe that they will get just what they pay for, as under private insurance. On the other hand some younger workers with a long period of taxpaying ahead of them and an even longer wait for benefits have been grumbling about rising social security taxes.[4] Others are asking Congressmen whether they are getting their money's worth under social security. In view of this increasing interest and concern, it seems in order to examine the issue within this framework. However, the objective of such analysis is to throw some light on the redistributive effects and dynamic features of the overall system, and it carries no implication that social security should be evaluated as a conventional insurance program.

SOME EARLIER VIEWS

The contradiction between the evaluations of Samuelson and Friedman cited above is due in part to differing assumptions. Samuelson counted on growth of real earnings of some 3 percent per year to enable the earning population to pay benefits to the retired population always

[3] This comparison carries no implication that an option to invest in equity capital could or should be built into the present social security system. The objective is to provide a yardstick against which the yield on this form of saving may be appraised. This, of course, may well be relevant to the decision as to the appropriate ceiling on taxable earnings, maximum tax rate, and ultimate size of the system.

[4] "We aren't reaching our young people," concedes one [AFL–CIO] politico. * * * For example, current * * * polls find young union members resentful of the federation's support for increased social security benefits; the money is to come from taxes, "and a lot of our groups don't like this money being taken out of their pockets." (John A. Grimes, "Labor's Image," *Wall Street Journal*, Mar. 1, 1967.)

much greater than the value of their accumulated taxes. However, he did not spell out the other conditions required in order for this to occur. Specifically, it is not clear whether he imputed interest to the accumulated taxes, or whether he discounted the prospective benefit stream.[5]

Friedman was referring to the type of analysis presented by Colin Campbell and others and based on current legislation.[6] Campbell took the scheduled tax and benefit structure as given and demonstrated that the value of taxes paid in the name of young workers, plus imputed interest at 4 percent, would be much greater upon retirement than the value at that time of scheduled benefits. However, his analysis did not allow for income growth and the likely corresponding increase in both taxes and benefits. Although both are expected to increase, this failure to allow for growth biases the estimate in favor of the "raw deal" argument since the benefits which a worker can expect grow for a longer period than the taxes he pays.

Perhaps baffled by the diversity of opinion on how individuals are faring under the system, one Congressman recently asked social security officials how he should answer his constituents on this issue:

> I would like an answer to the basic question that concerns the young person coming under the social security system as to whether this is a sound financial investment or whether he is being taken—whether he could invest his money elsewhere more wisely.[7]

The Social Security Administration responded with estimates by its Chief Actuary, Robert J. Myers, and included a critique of the bad-buy-for-the-young thesis such as that set down by Campbell.[8] It was stated that this argument is not true even if one makes the unrealistic assumption that present benefit schedules will remain unchanged.[9] Even if they were fixed, the Administration argued, social security is a good buy under present law for the young worker in terms of the tax which he himself will be asked to pay; on the assumption of a 3¾-percent interest rate, this was estimated to be only 80 to 85 percent of the value of the prospective benefits. Even earners paying the present and proposed maximum tax were said to come out about even.

The findings of Campbell and others were indicted on two additional counts: (1) Failure to take into account the value of the survivor and disability insurance protection, and (2) the usual assumption that the employer tax belongs to, and in the absence of social security,

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[5] For technical analysis of dynamic features of a social insurance system see Paul A. Samuelson, "An Exact Consumption-Loan Model of Interest With or Without the Social Contrivance of Money," *Journal of Political Economy*, LXVI, December 1958, pp. 467–482 and Henry Aaron, "The Social Insurance Paradox," *The Canadian Journal of Economics and Political Science*, XXXII, No. 3, August 1966, pp. 371–374.

[6] Colin D. and Rosemary G. Campbell, "You'll Never Get Back All Those Old-Age 'Contributions.'" *The Washington Post*, Nov. 7, 1965, sec. E, p. 3, and James M. Buchanan and Colin D. Campbell, "Voluntary Social Security," *Wall Street Journal*, Dec. 20, 1966, p. 14. For similar calculations, see Ray M. Peterson, "The Coming Din of Inequity," *The Journal of the American Medical Association*, Apr. 8, 1961, pp. 34–40, and more recent estimates by Mr. Peterson reported by Elizabeth Deran in "Income Redistribution Under the Social Security System." *National Tax Journal*, September 1966, pp. 276–285.

[7] *President's Proposals for Revision in the Social Security System* (hearings before the Committee on Ways and Means, House of Representatives, Mar. 1, 2, and 3, 1967), question of Congressman Ullman, p. 329.

[8] *Ibid.*, pp. 330–41.

[9] Officials forecast that earnings increases will permit increases in benefit schedules without higher tax rates.

would be available to, each employee in an amount equal to his own contribution. These two points are subject to criticism. It is true that failure to recognize that only part of the tax is designated for retirement benefits would distort any analysis, but the writers criticized were generally aware of this problem.[10] Much more important is the second point concerning the treatment of the employer's portion of the tax. Estimation of the aggregate lifetime burden of social security taxes on a worker requires an appraisal of the extent to which the employer's tax is borne by the earner.[11] This complex question cannot be treated in detail here, but it is so fundamental that a brief digression on this problem seems worthwhile.

ON THE INCIDENCE OF THE TAX ON EMPLOYERS[11a]

The early literature on the incidence of the employer tax was summed up in 1941:

> Economists who, in the years preceding the introduction of the Social Security Act, had given the problem of incidence careful consideration, seem to have been in general agreement that a payroll tax, whether levied on the worker or the employer, would be paid ultimately by the workers. * * * In the years that have passed since the Social Security Act became law, the weight of informed opinion still seems to be that the payroll tax is borne largely by the workers.[12]

Although earlier economic reasoning rested on the marginal productivity theory of wages under rather simplified assumptions, this consensus among economists that in the long run labor bears this very generally applicable tax appears to have persisted, although with less unanimity.[13] The social accounting convention recommended in the *U.N. System of National Accounts* and followed by many countries other than the United States also implies that the employer tax is borne by labor; it is treated as though it were a tax deducted at the source from employees' income.

Clearly, on the assumption of a highly inelastic aggregate labor supply and a downward sloping labor demand curve reflecting variation of the total compensation rate with employment, the marginal productivity theory shows that labor must absorb a payroll tax if employment is not to be reduced. However, the essence of the more general argument is that it should matter little to an employer how he pays a given amount of total compensation (including social se-

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[10] For example, Campbell was not guilty of this error; he deducted 20 percent of the tax to remove the portion estimated to be needed to finance OASDI benefits other than those of the aged. This same 20 percent figure is mentioned by the actuary as the appropriate fraction to eliminate (*Ibid.*, p. 331). In any case the adjustment appears to be of little practical consequence; the actuary indicates in an unpublished memorandum that disability benefits and survivor benefits due to preretirement death are roughly paid for by the sum of the contributions for the beneficiaries and by those who die before retirement without eligible survivors.

[11] The incidence of the employee's tax is not at issue since the usual view that direct taxes on individual earnings rest on those who pay them has rarely been questioned in the literature on the social security tax.

[11a] In this section it is argued that the tax paid by employers on behalf of their employees is actually borne by the employees. This premise is fundamental to the later estimates, but the brief technical case made for it here may be omitted by readers primarily interested in the quantitative findings.

[12] Seymour Harris, *Economics of Social Security*, pp. 285–286.

[13] In the short run the picture is undoubtedly less clear cut. There may be lags in the response by employers, short-run constraints imposed by the minimum wage and union scales and other rigidities.

curity taxes as well as ordinary fringe benefits).[14] Whatever the degree of competition and elasticities in the labor market a certain level of total compensation will be arrived at under prevailing conditions of labor demand and supply.[15] Any external imposition of an addition to total compensation such as the employer social security tax will tend to be countered by a granting of less compensation of other types than would be the case without the tax. Following this reasoning, the employer contribution is viewed as a substitute for other types of labor income and in effect paid out of labor's potential share.[16]

Although the above argument is entirely theoretical, the present writer has also completed, but not yet reported, an empirical investigation of the tradeoff between employer payroll taxes and other compensation. The analysis was primarily in a production function type of framework. Cross-country regressions showed clearly that at a given level of labor productivity industries in countries with relatively high employer payroll taxes paid a basic wage that was relatively low by about the same amount. Hence the tax is seen to be shifted to labor since the larger the tax the lower the basic wage the workers with given productivity tend to receive. Similar results, though less statistically convincing, were obtained from time series analysis of U.S. data.

It should be stressed that the criticism by the Social Security Administration of the imputation of the employer tax to each employee does not imply rejection of the previous general argument that labor as a whole bears the tax. Its argument is on a different ground:

> Even though it is true that the employer contribution in the final analysis is borne in considerable part by employees, either because they receive lower wages than they otherwise would or because as consumers they pay higher prices than they otherwise would, it does not follow that the incidence of the employer tax falls on wage earners in exact proportion to the earnings on which the tax is paid. The incidence of the tax will depend in specific instances on a variety of complex factors. The employer tax, therefore, may be looked on as being for the use of the system as a whole, and not as a matching contribution that is to be credited to each particular employee on the basis of the amount he paid.[17]

On this ground the employer's tax was disregarded by the chief actuary in his memorandum suggesting that most earners are scheduled to get more than their "money's worth." [18] However, even if it is agreed that precise imputation of the burden of the employer tax to individuals is not possible it is apparent that omission of this part of the

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[14] Employers are probably not totally indifferent concerning this. They may be willing to pay somewhat more toward a retirement fund than in basic wage increases because this may save them charitable obligations later, or because they basically believe forced saving is a good thing.

[15] This does not imply that the demand and supply conditions yield a unique determination of the compensation level. They may tend only to determine a bargaining range. (See, e.g., William J. Fellner, "Prices and Wages Under Bilateral Monopoly," *Quarterly Journal of Economics*, vol. 61, August 1947, pp. 503–532). The point is that the employer has no reason to react much differently to the tax and other labor costs, respectively.

[16] An attempt by labor to resist this tradeoff process could maintain the basic earnings rate at the expense of increased unemployment and reduced aggregate earnings. However, this resistance would not occur if the labor supply were highly inelastic, or if labor bargained in terms of total compensation in the first place.

[17] President's Proposals for Revision of the Social Security System, *op. cit.*, p. 330–31.

[18] *Op. cit.*, pp. 331–46.

tax is bound to produce seriously misleading results. Even if the proceeds are "for the use of the system as a whole" it does not follow that the tax is a burden to no one. In other words, the concern here is with the cost of the tax to the individual worker and not with the cost to the system of the ultimate benefit to that worker. It is difficult to understand an analysis which agrees that the employer tax "is borne in considerable part by employees" and yet ignores it in evaluating the tax paid by individuals.[19] If it is paid by employees as a group it must also be paid by them as individuals, and it seems better to make an imperfect imputation which is roughly right rather than to settle for being precisely wrong.

Another implication of the exclusion of the employer tax should be noted. The Myers memorandum discusses the tax on various earnings levels. When no employer tax is imputed to a group of earners such as the substantial number paying the maximum employee tax, this implies that lower income earners bear more than their proportional share of this tax if it is agreed that the tax is borne by employees as a whole. If so, the lower income employees as a whole would pay even more than double the employee tax and their "deal" would be much less good than suggested in the memorandum. Since there is no reason to expect that this anomaly exists and the employer tax cannot be realistically ignored, there seems no better alternative than to impute the employer tax to employees in proportion to the employee tax. This is in accord with the original theory, since even at the individual level we presume that the larger the employer tax the less the compensation of other types which can be extracted by the employee.

B. THE BASIC MODEL*

If the above reasoning is correct, the method underlying the tax-benefit ratios presented in the Myers memorandum is biased in two opposite directions. Failure to allow for the longer growth of benefits than taxes during a worker's lifetime undervalues the "deal" expected for a participant in the system, whereas excluding the employer tax presumably borne by the worker overvalues the arrangement. An attempt will be made in what follows to circumvent these opposing biases.

In this section, and the following, the stress is on *average* taxes and benefits per worker under assumed growth patterns, and it is assumed that the average earner pays the average tax. This per capita approach abstracts temporarily from the ceiling on taxable earnings and variations in the relative position of different types of earners, and focuses on earner-beneficiary transfers. It also must be acknowledged that introduction of assumptions concerning growth of the system introduces an element of arbitrariness into the analysis. However, it seems likely that almost any plausible growth assumptions will provide a more

[19] This has its counterpart in the treatment of undistributed corporate profits by some writers on the size distribution of individual incomes. Although it is the common saving of stockholders as a whole these writers refuse to impute it to individuals. This pretense that corporate saving is nobody's income understates the relative income share of high income ranks.

*This section reports the methodology developed to estimate the rates of return. It may be omitted by readers more interested in the findings rather than their technical basis.

realistic analytical basis than the static assumptions concerning taxes and benefits accepted reluctantly in previous studies. Similarly, it is believed that a proportional imputation of the employer tax is preferable to ignoring its burden altogether. However, at this stage the only imputation is at the aggregate level, since only average taxes and benefits per worker are being considered. Assuming that workers as a whole bear the entire tax, it follows that the *average* tax per worker must include the tax nominally assigned to employers, regardless of how it is distributed among workers.

The model to be suggested approximates certain features of the current and developing social security system and incorporates available official data such as projections by the Social Security Administration of population by age group and mortality rates by sex. The result is a mixture of theoretical and empirical elements. It abstracts from many of the details of the present tax-benefit structure in an effort to focus on the key effects of the growth process. The present analysis also departs from earlier work in another way. Instead of assuming particular rates of return, the criterion stressed is the estimated yield to a particular type of participant on his "investment" in social security.

The basic assumptions of this simple growth model are: (1) Real earnings per employee grow at a fixed rate, r; (2) real retirement benefits per beneficiary grow at the same rate, r, and, therefore, are related to average earnings by a fixed factor, k;[20] and (3) the system is financed on a pay-as-you-go basis.[21]

The particular tradeoff between the tax rate and the taxable earnings ceiling to be used in raising the required tax is left unspecified at this stage. Nonretirement benefits and the taxes needed to raise them are both excluded from this model, and this avoids the bias produced by weighing old-age benefits alone against taxes raised for more general purposes. The postulated pay-as-you-go financing and fixed benefit-earning ratio are intended to provide an approximate skeleton of the dynamic features of the actual detailed social security structure. Although never precisely realized, they should permit a more meaningful analysis of the projected system than that possible with earnings, tax rates, and benefit rates held constant.

This preliminary framework abstracts completely from the detailed differentials in tax and benefit rates by income levels and family

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[20] Despite some irregularities this is roughly the experience of the system in the 1940–64 interval. For example, when benefits began to be paid in 1940 the mean payment for a beneficiary and wife was about 43 percent of mean earnings of covered workers. In 1964 the ratio was 37 percent. The ratio lagged between 1940 and 1949 as coverage widened, then jumped to the current level and has been relatively stable since. (See *Social Security Bulletin, Annual Statistical Supplement,* 1964, pp. 27 and 29.) This assumption concerning the growth rate of *average* benefits abstracts from the pattern at the individual level under the present system. Average benefits promised each earner grow with the rise in his taxable earnings and with statutory increases. Only the latter raise benefits after retirement. Thus the benefits of a newly retired worker will tend to start out above the average level but lag behind the average in later years. Allowance for this time path would yield a somewhat higher estimate of the present value of the benefit stream upon retirement. However, this might well be offset by the higher tax estimate that would result from allowing for below-average earnings in early years and above-average earnings later.

[21] Some growth in the actual trust fund is foreseen by the Social Security Administration over and above the interest accumulated, but it is generally agreed that the system is far closer to a pay-as-you-go basis than a fully funded basis. In fact, the Chief Actuary, Mr. Myers, interprets the financing basis as unchanged from the beginning "insofar as general principles are concerned—namely, that full actuarial reserves are not developed; rather, over a long-range future period, the income is estimated to meet the outgo." (Letter to David Lawrence reproduced in *Hearings Before the Joint Economic Committee on the 1967 Economic Report of the President,* Feb. 7, 8, and 9, 1967, pt. 2, p. 354.)

type and is concerned only with per capita taxes and per capita benefits. Let—

$\overline{E}_t$ = average (mean) real earnings in year t
$b_t = \overline{k}\overline{E}$ = average real benefit in year t (where $\overline{k}$ is fixed ratio of current $\overline{E}_t$ to $\overline{b}_t$)
W_t = total earning (taxpaying) population
R_t = total old-age beneficiary (largely retired) population
T_t = average real tax in year t (including both employer and employee contributions)

Assuming pay-as-you-go financing and an exponential growth rate r and $\overline{E}_t$,

$$\overline{T}_t = \frac{\overline{k}\overline{E}_t R_t}{W_t} = \frac{\overline{k}\overline{E}_0(1+r)^t R_t}{W_t} \tag{1}$$

Given $\overline{k}$ and projections of $\overline{E}$, R, and W, the projected average tax can be obtained and accumulated along with imputed interest.

The present value of the average benefit stream beginning at age 65 [22] may then be compared to the accumulated tax. Let—

b_n = average benefit during the year at age n
B = present value of the average benefit stream at age 65
P_n = probability of reaching age n, given that one has reached age 65
L = length of working career

The discounted present value of the still-growing benefit stream is given by—

$$B = \sum_{n=65}^{\infty} \frac{b_{65}(1+r)^{n-65}}{(1+i)^{n-65}} \cdot P_n \tag{2}$$

However, the first annual benefit at age 65 is—

$$b_{65} = \overline{k}\overline{E}_0(1+r)^L$$

Therefore, equation (2) may be rewritten as—

$$B = \overline{k}\overline{E}_0 \sum_{n=65}^{\infty} \frac{(1+r)^{L+n-65}}{(1+i)^{n-65}} \cdot P_n \tag{3}$$

It is apparent from equation (1) that the accumulated tax must be directly proportional to (a multiple of) $\overline{k}\overline{E}_0$ which is the average benefit in the initial year. Since equation (3) shows this to be true also of the present value of benefits at retirement the initial benefit factor cancels out in computation of the tax-benefit ratio; since the latter is therefore independent of the initial benefit, the accumulated tax can be stated generally as a multiple of the starting benefit level, and no estimate is needed of the latter. Under the assumptions of the model the ratio of the accumulated average tax to the present value of average benefits at age 65 depends only on the assumed values of the growth

[22] Estimates will be given for this typical retirement age only, although the Social Security Administration puts the average retirement age at 67. This avoids the complexities of the "earnings test" but qualifies the results since later retirement leads to more taxes and less benefits. On the other hand it seems likely that the standard retirement age will eventually be lowered, so that age 65 may be a plausible compromise.

rate, the rate of return, the type of demographic projections (including P_n) and the length of the working career L.

The values of P_n to be used in equation (3) for single males and single females are derived directly from the official projected mortality rates for males and females. However, the probabilities to be used in evaluating the benefit stream of a couple (eligible for wife's benefits) are compound probabilities involving the mortality rates of both sexes.[23] This evaluation required special treatment which for the first time required certain assumptions concerning the internal benefit structure.[24]

C. Projections of Tax-Benefit Ratios and Rates of Return for the Recipient of Average Earnings

Other studies of the return to participants in the social security system have stressed lifetime tax-benefit ratios. Such projections will be presented, briefly, here, but the main focus will be on a different criterion. The most arbitrary element in T/B projections is the rate of return imputed to taxes and used to discount benefits. Previous studies have attempted no deflation of taxes and benefits. However, even if they had, the real rate of return is probably even more difficult to project than the real earnings growth rate, and it also varies enormously from one type of asset to another. For this reason projections of the T/B ratios will not be stressed. Instead the measure sought was the real yield on contributions implied by any given tax-benefit projection.

The real rate of interest on contributions was defined as the particular rate of return which would equalize the real accumulated tax (plus imputed yield) and the present value of real benefits discounted at the same rate at the point of retirement. This is the yield which produces a tax-benefit ratio of unity according to previous definitions. Before presenting these, some examples will be given showing the sensitivity of projected T/B ratios to the assumptions concerning the rate of return.

THE EMPIRICAL APPROACH

The first estimates are on an average earner basis and continue to abstract from variations by family structure and income. Estimation of the tax-benefit ratios on the basis of relations (1) to (3) was routine, but several aspects of the estimates are relevant to a discussion of the findings. In the first place, for simplicity the tax was assumed to be paid annually at the beginning of each calendar year, with annual benefits beginning on the 65th birthday. In effect this simplification moves both taxes and benefits one-half year ahead of the pace

[23] These three beneficiary types are special cases intended to be illustrative only. It seems likely that they will have some relevance to the more complex tax-benefit relationships for working couples whose partners had working careers of varying lengths.

[24] First consider such a couple with a given starting benefit. (Allowance will be made ultimately for the fact that couples have higher starting benefits on the average than single earners.) Assume that upon the death of a wife a widower's benefits become two-thirds of the level originally received by the couple and a widow's benefits are 55 percent, as under the present law. Then the present value becomes the sum of three components—benefits as couple, and potential benefits as widower and as widow. Denoting the probability of living from 65 to age n as P_{nm} and P_{nf} for males and females, respectively, the present value of the stream received as a couple is obtained by replacing P_n in equation (3) by $P_{nm}P_{nf}$. The potential stream in the widower status is evaluated by replacing P_n by P_{nm} $(1-P_{nf})$ and multiplying by two-thirds. For the widow status the probability term is $(1-P_{nm})$ P_{nf} and the multiplier is 55 percent.

scheduled on a monthly basis, but this does not affect significantly the ratio of the two sums. Secondly, since the official projections of W_t and R_t were to be used in the computation of the annual tax per earner by equation (1) it was necessary to specify a starting year for the accumulation of the average tax. The year 1966 was chosen because it represented the inauguration of the current tax-benefit structure of the social security system.

Finally, the estimates of lifetime values of T and B under two alternative official cost projections were obtained for two or more specified values of each of several unmeasured variables affecting the estimate of T and B. The use of various assumed values provides some indication of the manner in which variations in the factors affect the T/B ratio and the yield on contributions. An attempt was made to encompass a plausible range in each of the following four variables: [25]

(1) The projected rate of growth of average real earnings was put alternatively at 2 percent and 3 percent. The past growth rates measured over relatively long periods appear generally to have fallen within this range. For example, one simple estimate shows a growth rate of 2.45 percent during the 1929–65 interval and 2.62 percent for 1947–65.[26]

(2) Two alternative sets of population and mortality projections developed by the Social Security Administration were also used. One set was prepared on "low-cost" (high birth rate and high mortality) assumptions and one on "high-cost" assumptions. The projected population with taxable earnings was taken to represent W_t. The projected number of aged beneficiaries was used as the measure of R_t.[27] The low-cost and high-cost projections of P_n are also deductibles from the official actuarial studies.[28]

(3) Another factor in the total tax accumulation is the age when work is begun. Even if all workers paid the average annual tax it would be necessary to distinguish between those starting early and those starting late. The taxes were accumulated from two alternative starting ages (and, therefore, for two different values of L). One earner was assumed to start work on his 18th birthday at the beginning of 1966 and pay the average tax over his working career; the other was assumed to start at age 22. Both were assumed to retire at age 65.

(4) The projected real rate of return was placed alternatively at 1.5, 3, 5, and 8 percent. A brief digression in support of this wide range of rates is probably in order. The objective was to allow for the great variation among rates of return available on different types of assets in recent decades. Chart 1 illustrates the contrast between the real yield

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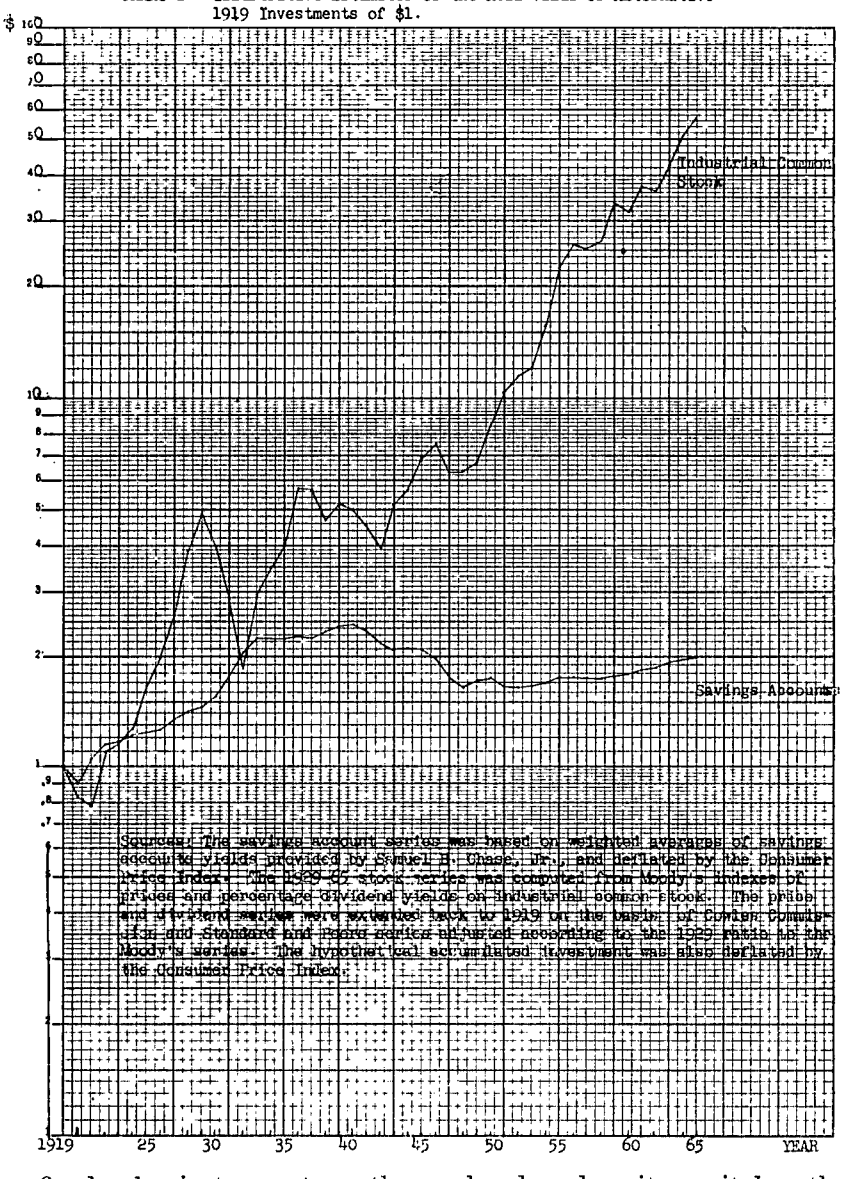
[25] This numerical analysis approach was chosen, because the functional form of the T/B ratio appeared too complex for formal analysis. Under further simplifying assumptions discussed later this is not the case.

[26] These are based on a 1929–65 time series of average annual earnings per full-time worker deflated by the Consumer Price Index. (The average earnings series was obtained from *The National Income and Product Accounts of the United States*, supplement to the *Survey of Current Business*, 1966, pp. 106–109.) The estimated growth rates were obtained from a trend line fitted to the logarithms of the observations.

[27] These two projections are given in *Long-Range Cost Estimates for Old-Age, Survivors, and Disability Insurance System, 1966*, Actuarial Study No. 63 by the Office of the Actuary, Social Security Administration, tables 3 and 8. Projections were not available annually. The average tax was assumed to grow exponentially between the years tabulated.

[28] *United States Population Projections for OASDHI Cost Estimates*, actuarial study No. 62, by the Office of the Actuary, Social Security Administration, gives projected mortality rates which are assumed to have leveled off after the year 2000. These are given for age groups at 5-year intervals; they were interpolated to 1-year intervals, according to the pattern given in *U.S. Life Tables:* 1959–61, vol. 1, No. 1, U.S. Department of Health, Education, and Welfare, December 1964.

CHART 1. Illustrative Estimates of the Real Value of Alternative 1919 Investments of $1.



on fixed value instruments on the one hand, and equity capital on the other. The savings account and industrial common stock curves each show hypothetical annual values in real terms of a single initial investment of $1 in 1919.[29]

[29] Similar curves were also obtained for index number series for long-term government bonds, Moody's AAA corporate bonds, and all common stocks. To avoid the index number problem the yield on mutual funds holding common stock was also considered. Government bonds generally yielded more than savings accounts and corporate yields were still higher. However, the contrast between interest rates and the yield on equity was the most striking feature of all these comparisons, as it is in chart 1. Finally, although the Consumer Price Index has been criticized as a deflator, alternative deflators would not dispel this contrast between real interest rates and the yield on equity.

The annual compound yield between any 2 years can be derived from the slope of the line on this logarithmic chart. Some of these yields are given for selected intervals in table 1. Except for a few very short intervals like 1929–32 the yield on equity greatly exceeded that on savings. Even an investment in this collection of stocks on the eve of the 1929 crash would have greatly outperformed the savings series in the long run, even though the stock series would not have caught up until 1946. Also, during the postwar rise in interest rates since 1951, savings yielded only 1.5 percent compared to 13 percent for the common stock series.

The four specified rates of return were chosen on two considerations. First, in terms of projections it was appropriate to admit the diverse options with respect to the long-run rate of return which past experience suggests are likely to be available. Secondly, it was essential that the assumed range be wide enough to cover the yields provided individuals under the social security program in various circumstances. This was required for accurate interpolation of these implied rates of return on contributions.

TABLE 1.—ILLUSTRATIVE ESTIMATES OF THE REAL ANNUAL RATE OF RETURN ON ALTERNATIVE INVESTMENTS SELECTED INTERVALS, PERCENT

Interval	Savings accounts	Industrial common stock
1919–65	1.5	9.2
1929–32	12.0	−27.7
1929–65	0.9	7.0
1932–37	1.7	25.1
1937–42	−0.6	−6.9
1942–46	−2.5	17.4
1946–65	0.1	11.2
1951–65	1.5	1.30

Source: See chart 1.

RESULTS FOR THE RECIPIENT OF AVERAGE EARNINGS

As indicated above the assumptions of the model permit the lifetime average tax accumulations to be expressed as real magnitudes and as multiples of the average benefit in 1966. The nature of the dependence of these on our assumptions (including only the two intermediate rates of return) is indicated in table 2.[30] These results show the expected relationships. The estimated lifetime tax plus imputed return is greater for high growth rates, high cost projections and the early starting age. The total accumulation is greater the higher the assumed rate of return.[31]

[30] The postulated rates of return of 1.5 and 8 percent are omitted here for brevity. However, the relationships in this range are included in later estimates of an individual's effective rate of return under the retirement program.

[31] No distinction has been made here between the tax rates on the self-employed and others. Since the tax on the self-employed is 25 percent below the combined employer-employee rate, the lifetime tax on employed workers must be somewhat higher than shown in the table and the tax on self-employed 25 percent below that of the employed. The differential is scheduled to become even greater in the future. However, if self-employed income were corrected for imputed profits, their tax rate on earnings might be about the same.

TABLE 2.—AVERAGE LIFETIME ACCUMULATED TAX ON VARIOUS ASSUMPTIONS, STATED AS MULTIPLES OF THE AVERAGE BENEFIT IN 1966

Type of projection and starting age	r=2 percent		r=3 percent	
	i=3	i=5	i=3	i=5
Low cost, start at 18	29.64	49.63	36.66	59.42
Low cost, start at 22	24.52	39.06	29.80	46.21
High cost, start at 18	32.88	54.25	40.97	65.42
High cost, start at 22	26.98	42.46	32.99	50.52

The present value of the benefit stream at age 65 can be conveniently and meaningfully stated as a multiple of the initial benefit at age 65. It was assumed that all earners will work long enough so that benefits will be independent of the starting age. As indicated in the last section, the present value of this stream will vary with sex and family composition due to the different mortality projections for males and females. Table 3 gives the present value of the benefit stream for three specified types of beneficiaries at age 65. These ratios are consistent with *a priori* expectations. The present value varies directly with the growth rate, and inversely with interest rates. The high cost (low mortality) estimates show somewhat higher values, and females have higher values than males because of their lower mortality rates. Couples eligible for wife's benefit have almost as high values as single females with the same starting benefits despite the reduction in benefits when one person dies. Since the values for these couples are closer to those for females than those for males this cut in benefits appears to be more than offset by the longer period during which at least one person is expected to receive benefits.

ABLE 3.—VALUE AT AGE 65 OF STREAM OF REAL BENEFI TS UNDER VARIOUS ASSUMPTIONS STATED AS A MULTIPLE OF THE INITIAL ANNUAL BENEFIT ON THE 65TH BIRTHDAY

Type of project and family composition	r=2 percent		r=3 percent	
	i=3	i=5	i=3	i=5
Low cost, single male or married male with wife who worked	13.13	11.26	14.28	12.15
Low cost, single female or married female with nondependent husband	15.60	13.16	17.14	14.30
Low cost, couple eligible for wife's benefit	15.10	12.75	16.56	13.86
High cost, single male or married male with wife who worked	13.92	11.86	15.20	12.84
High cost, single female or married female with nondependent husband	16.39	13.72	18.08	14.98
High cost, couple eligible for wife's benefit	15.89	13.33	17.50	14.55

Tables 2 and 3 form the basis for derivation of lifetime tax-benefit ratios for a recipient of average income. If it were reasonable to assume that a single benefit-earnings ratio $\bar{k}$ defined this starting benefit for the average earner it would be necessary only to restate table 3 in multiples of the 1966 starting benefit [32] and take the ratio of the tax measures in table 2 to the benefit measures in table 3. However, a rough allowance will be made in this section for one feature of the present

[32] The adjustment factors for table 3 are based on the earlier assumption that average real benefits grow at the annual rate.

and proposed social security laws—the variation of the initial benefit-earnings ratio with the composition of retired worker families. The only distinction considered was that between (*a*) couples in which the male retired worker is entitled to benefits for a wife, and (*b*) all other retired workers, whether married or not. Under current and proposed law the benefit-earning ratio is about 50 percent higher for group (*a*) than for group (*b*). This was taken into account in the tax-benefit ratios for average earners reported in table 4.[33]

TABLE 4.—ESTIMATED AVERAGE LIFETIME TAX-BENEFIT RATIOS FOR RECIPIENTS OF AVERAGE EARNINGS, VARIOUS ASSUMPTIONS, PERCENT

Type of projection, starting age, family composition	r=2 percent		r=3 percent	
	i=3	i=5	i=3	i=5
Low cost, 18, male [1]	102.6	200.1	76.6	146.0
Low cost, 18, female [2]	86.3	171.1	63.8	123.9
Low cost, 18, couple [3]	59.4	117.8	44.0	85.3
Low cost, 22, male [1]	84.8	157.6	62.2	113.5
Low cost, 22, female [2]	71.3	134.7	51.9	96.4
Low cost, 22, couple [3]	49.1	92.6	35.7	66.3
High cost, 18, male [1]	107.2	207.7	80.4	152.0
High cost, 18, female [2]	91.1	179.5	67.7	130.3
High cost, 18, couple [3]	62.6	123.1	46.6	89.5
High cost, 22, male [1]	88.0	162.4	64.8	117.4
High cost, 22, female [2]	74.7	140.5	54.5	100.6
High cost, 22, couple [3]	51.3	96.4	37.6	69.1

[1] Single male or married male with wife who worked.
[2] Single female or married female with nondependent husband.
[3] Couple eligible for wife's benefit.

Source: Table 2 and table 3 (adjusted to multiples of 1966 starting benefit level).

The estimated tax-benefit ratios show the expected relationships. High growth rates, low imputed return, low-cost projections and a late starting age make for relatively good buys. The extreme cases under the particular assumptions of table 4 are T/B ratios of 36 percent and 208 percent.[34] The participant would clearly get a bargain in all cases if the growth rate were as great as the rate of return, but he would generally fare poorly if the growth rate were substantially lower. The college graduate who starts work at 22 fares much better than the high school graduate in this special case in which they both earn the average wage;[35] couples with nonworking wives do relatively well. However, it is apparent that the T/B ratios are so heavily dependent on the rate of return assumed that any absolute evaluation

[33] The 1964 *Annual Statistical Supplement to the Social Security Bulletin,* p. 47, indicates that about one-eighth of new retired worker families in 1964 were headed by males entitled to benefits for aged wives or for younger wives with at least one child. Ignoring the small number who had child beneficiaries only, a rough indication of the effect of the differential can be obtained by assuming this one-eighth of retired workers had an average starting benefit-earnings ratio 50 percent above that of all others. The total benefit earnings ratio $\bar{k}$ is a weighted mean of the k's for the two subgroups, implying that these k's are approximately $1.41\ \bar{k}$ and $0.94\ \bar{k}$, respectively. These factors were used to obtain separate T/B ratios for the two subgroups.

[34] The spread would, of course, be much wider if a wider range of rates of return were considered.

[35] This comparison should be qualified by recognition that college graduates have a higher average wage and generally lower statutory benefit-earnings ratios. Some effects of the graduated benefit-earnings schedule are discussed in sec. D.

of the tax-benefit relationship provided to different groups under the system would be arbitrary. More meaningful is the implied rate of return for each group—the rate which equalizes the value of the tax and benefit streams. These are given in table 5 and may be compared with alternative yields on investment which have been avaliable in the past, such as those illustrated earlier in chart 1.[36] If past experience is a plausible guide, social security participants in these categories will fare much better than they would if offered the option of a private savings program. On the other hand these relatively attractive rates of return fall considerably short of the long-run yield on equity capital in recent decades.

TABLE 5.—ESTIMATED REAL RATES OF RETURN ON CONTRIBUTIONS FOR RECIPIENTS OF AVERAGE EARNINGS, VARIOUS ASSUMPTIONS, PERCENT

Type of projection, starting age, family composition	r=2 percent	r=3 percent
Low cost, 18, male [1]	2.92	3.83
Low cost, 18, female [2]	3.43	4.35
Low cost, 18, couple [3]	4.52	5.51
Low cost, 22, male [1]	3.53	4.58
Low cost, 22, female [2]	4.06	5.11
Low cost, 22, couple [3]	5.23	6.28
High cost, 18, male [1]	2.78	3.68
High cost, 18, female [2]	3.28	4.21
High cost, 18, couple [3]	4.38	5.32
High cost, 22, male [1]	3.42	4.46
High cost, 22, female [2]	3.92	4.98
High cost, 22, couple [3]	5.12	6.16

[1] Single male or married male with wife who worked.
[2] Single female or married female with nondependent husband.
[3] Couple eligible for wife's benefit.

The yields projected for these average earners under various assumptions range from 2.78 percent to 6.28 percent. This spread indicates substantial income redistribution among categories of participants. However, even the least-favored group (single male, starting work at 18, facing a high-cost system and a slow-earnings growth rate) would fare much better over the long run than private savers have in the past. Clearly the key assumption of the present analysis is that benefits keep pace with earnings. Insofar as the assumption holds, the social security participant, like an investor in equities, generally has a considerable advantage over an investor in fixed dollar obligations subject to inflationary erosion.

D. The Effect of Individual Earning Level on the Rate of Return on Contributions

Until now the ceiling on taxable earnings and the relationship of benefits and past earnings have not been considered. In terms of trans-

[36] The estimated yields here and later were obtained by semilogarithmic interpolation. Inspection showed a close linear relationship between log T/B and the four specified rates of return i. The estimates are linear interpolation for the value of i yielding log $T/B=0$.

fers on a lifetime basis, another major redistributional feature of the social security system is the relatively high benefit-earnings ratios assigned to low-income groups. This feature is clearly "progressive" in the classical sense.[37] The extent of progressivity under a given tax-benefit structure varies with the relation between the earnings ceiling and average earnings. Departing from the previous emphasis on the average earner, the progressivity of the system will be considered here via the particular examples of the ceiling and benefit-earnings structure in effect since 1966 and the new laws proposed in 1967.

Two revisions of the previous per capita analysis are required. In the first place, in the presence of a ceiling on taxable earnings it is no longer true that the recipient of average earnings pays the average tax. This mean tax is paid by a worker who earns the mean taxable income throughout his career. Secondly, it is now recognized that the benefit-earnings ratio k, though still assumed invariant over time, varies cross-sectionally with the earnings level. The revised tax-benefit ratios based on the 1966 structure were obtained in two steps. First the average taxable earning in 1966 was put at $3,700.[38] Adjustment of the T/B ratios to allow for the effect of the graduated benefit-earnings schedule was then accomplished by a multiplicative correction. Each multiplier is the ratio of the statutory k value for the specified earnings level to the k value for the recipient of the mean taxable income of $3,700.[39] The ratios in table 4 were adjusted by these factors associated with earnings. The analysis presumes that the benefit-earnings ratios in the starting year 1966 remain fixed throughout the worker's life.

The yield under each assumption and by income level was obtained as before by interpolation. These yields are reported for selected income levels in table 6. It is apparent that graduation of the benefit-earnings schedule produces a substantial graduation in the yield-earning relationship.[40] For example the yields for $2,000 earners are generally 1½ percentage points or more higher than for those earning $6,600 or more and paying the maximum tax. However, even the most unfavorable projection for the latter continues to show a real rate of return over 2 percent which is generally better in the long-run than the savings account yield shown in chart 1.

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[37] On a static, single-year basis progressivity is also introduced by the tendency for the taxes on relatively high-income earning population to accrue as benefits to the relatively low-income retired population.

[38] See *Actuarial Study No. 63, op. cit.*, p. 24.

[39] Estimates of these statutory k values by income level were obtained by interpolation in the official tables. The tables are provided by the Social Security Administration in *1967 Social Security Recommendations* (mimeographed), Jan. 21, 1967, table following p. 2. The use of statutory k values abstracts from details of the moving average of earnings levels on which benefits are based; there is also no way of knowing whether this schedule is consistent with our pay-as-you-go assumption. However, only the slope of the benefit-earning relationship shown in the official schedule is essential to the present argument. This allowance for the current degree of graduation serves adequately the broad purpose of displaying this progressive feature of the system.

[40] The degree of graduation is probably somewhat exaggerated because no correction could be made for the higher mortality rates of low-income earners. This makes a given benefit stream worth less to them than indicated by overall mortality. (They get some compensation for this in the life insurance features of social security, which are not considered here.)

TABLE 6.—ESTIMATED REAL RATES OF RETURN ON CONTRIBUTIONS, VARIOUS ASSUMPTIONS AND EARNINGS LEVELS, 1966 LAWS

[In percent]

Assumptions				Taxable earnings levels				
r	Cost	Age	Type[1]	$2,000	$4,000	$6,000	$6,600+	Mean
2	L	18	M	3.78	2.82	2.39	2.30	2.92
2	L	18	F	4.27	3.34	2.93	2.85	3.43
2	L	18	C	5.34	4.43	4.02	3.94	4.52
3	L	18	M	4.72	3.73	3.30	3.21	3.83
3	L	18	F	5.22	4.26	3.84	3.76	4.35
3	L	18	C	6.28	5.36	4.97	4.88	5.51
2	L	22	M	4.46	3.43	2.98	2.89	3.53
2	L	22	F	4.97	3.96	3.53	3.44	4.06
2	L	22	C	6.10	5.13	4.71	4.62	5.23
3	L	22	M	5.51	4.47	4.02	3.92	4.58
3	L	22	F	6.00	5.01	4.57	4.48	5.11
3	L	22	C	7.17	6.18	5.75	5.66	6.28
2	H	18	M	3.66	2.68	2.24	2.15	2.78
2	H	18	F	4.12	3.18	2.76	2.68	3.28
2	H	18	C	5.22	4.29	3.88	3.80	4.38
3	H	18	M	4.59	3.58	3.15	3.06	3.68
3	H	18	F	5.06	4.09	3.67	3.58	4.21
3	H	18	C	6.16	5.23	4.82	4.73	5.32
2	H	22	M	4.36	3.31	2.86	2.76	3.42
2	H	22	F	4.83	3.82	3.39	3.30	3.92
2	H	22	C	6.06	5.01	4.58	4.48	5.12
3	H	22	M	5.40	4.35	3.89	3.79	4.46
3	H	22	F	5.88	4.87	4.43	4.33	4.98
3	H	22	C	7.05	6.06	5.63	5.54	6.16

[1] The 3 types of recipient are: M (single male or married male with wife who worked); F (single female or married female with nondependent husband); and C (couple eligible for wife's benefit).

Yields over 7 percent appear in the table, but these are for the unlikely case of an earner who waits to start work until age 22, but nevertheless commands an income only slightly more than half the mean. However, yields of over 6 percent are projected at this income level for those beginning at age 22 and eligible for wife's benefits. Despite the rather pronounced variation in these projected yields they continue to be bounded by the poor past performance of savings accounts and the lucrative long-term results of investment in equity.

To illustrate at a very hypothetical level the effect of the recently proposed social security changes one more set of estimates was computed assuming a $10,800 ceiling and the proposed new benefit-earnings schedule.[41] It was estimated that the higher ceiling would yield an average taxable income of $4,225 in 1966 compared to $3,700 under the actual ceiling.[42] Allowance for this and the proposed change in the benefit-earnings schedule produces a further graduation of the yield-earnings relationship, as shown in chart 2.[43]

[41] This is purely illustrative since this higher ceiling would go into effect in 1973. Once more, there is no way of learning whether the changes are consistent with the pay-as-you-go assumption. However, the slope of the benefit-earnings schedule is the key element in this exercise. The results should be at least indicative of the order of magnitude of changes of this type.

[42] The alternative average taxable earnings in 1966 was estimated by means of the relationship between the percentage of earnings taxable and the ratio of the ceiling to the mean available for 1964. in Michael Resnick, "Annual Earnings and the Taxable Maximum for OASDHI," Social Security *Bulletin*, November 1966, vol. 29, No. 11, 1965.

[43] These sketches do not indicate the relative importance of the two factors in this change. The proposed new schedule is somewhat more graduated than the old since the proposed minimum benefit represents a relatively greater increase than at other levels. However, even an increase in the ceiling alone would further graduate the yields if the tax rate were adjusted to keep total tax receipts unchanged; this would increase taxes of upper income groups and lower payments by others while leaving benefits unchanged.

YIELD i
CHART 2. RELATIONSHIP BETWEEN YIELD, 1966 EARNINGS LEVEL AND ASSUMED GROWTH RATE, VARIOUS CATEGORIES, HIGH COST ASSUMPTIONS. ACTUAL AND PROPOSED CEILING BENEFIT EARNINGS SCHEDULE
START WORK AT 18
EARNINGS
2,000
4,000
6,600
MALE, ACTUAL
MALE, PROPOSED
FEMALE, ACTUAL
FEMALE, PROPOSED
COUPLE, ACTUAL
COUPLE, PROPOSED
i = EARNINGS GROWTH RATE (PERCENT)
START WORK AT 22
i = EARNINGS GROWTH RATE (PERCENT)

This summary portrayal in chart 2 attempts to illustrate in one place the key factors affecting the yield on a participant's saving under the social security system.[44] In each individual chart the higher yield to low incomes is pronounced. Although not much should be made of the hypothetical projections labeled "proposed" on the chart the greater distance between the lines in the vertical direction shows the effect of a higher ceiling in the starting year and a more graduated benefit-earnings curve. The boost in the yield to each category of worker which accompanies a high earnings growth rate is shown in each graph. The relative advantage of a couple receiving wife's benefits[45] and the late starter are also pointed up once more.

E. Concluding Remarks

In a question cited earlier, Congressman Ullman asked whether social security is a sound investment for a young person or whether he is being "taken." This question has two aspects. In the first place the differentials among the yields to individuals require evaluation. Second, are the absolute levels of the yields sufficient to justify this compulsory saving? The model and statistical projections presented above offer no unique or unequivocal answer to these questions. However, the assumptions, reasoning, and projected yields on saving under social security have been presented in detail so that the reader may evaluate the analysis and judge for himself the adequacy of the yield accruing to various categories of participants. It should be reiterated at this point that there is no logical or practical reason for regarding these varying yields as the basic criteria for appraising the tax and benefit structures of the system; the program is so far removed from the private insurance model that it is appropriate to evaluate the two structures independently. Even so the loose tax-benefit relationship that does exist justifies a few tentative and qualified observations concerning the projected yields to various groups covered by the system.

Obviously, some participants in social security are faring much better than others, but this type of differentiation also exists under the generally approved graduated income tax. The relatively high rate of return to low income groups under social security is consistent with their being assigned a low burden under the income tax. The relatively high return to couples who did not have the benefit of a wife's income may well be consistent with the objective of redistributing income in favor of those with greater need. However, this is by no means certain, since nonworking wives may tend to be concentrated among high income couples. It is clear, of course, that neither of these redistributional features is consistent with the insurance analogy frequently associated with the system, but that is irrelevant to their appraisal.

Less acceptable in terms either of values or logic, if we continue to think in terms of lifetime tax benefit relationships, are the higher

[44] Despite the lines drawn on each small graph, it should be noted that each is based on only two points—one for each growth rate: the actual relation may not be linear. The relationships for only one of the two cost projections are given, because the differences between the two are so minor, as may be seen in table 6.

[45] The estimates for relatively high earnings levels must be qualified due to their failure to take account of the current practice of placing a ceiling on wife's benefits.

yields for women [46] and late entrants to the work force. The advantage of women is minor, but the relative bargain of late starters is not trivial and would be difficult to justify within this conceptual framework. Presumably, late starters are typically college graduates or even recipients of higher degrees who will tend ultimately to have relatively high income, but will be taxed for fewer years and thus enjoy a favorable differential comparable to their advantage with respect to military service.[47]

This discrimination in favor of the late starter could be alleviated by increasing the tax rates and/or ceiling sufficiently to permit exemption of earners under 25 from the social security tax.

Another feature of the law which has not been treated explicitly in the numerical estimates is the tax differential in favor of the self-employed who are taxed at a rate 25 percent below the combined employer-employee rate. The self-employed have not been analyzed separately, because it seems possible that if the appropriate part of their income were imputed to them as profits their effective tax rate on *earnings* might then be on a par with that charged employees. On the other hand a comparison of national income accounts and tax return data suggests that underreporting of self-employed income may be about enough greater than underreporting of earnings to offset the part of their tax they are currently paying on profits. If so, the true yield to the self-employed is considerably higher than to earners at the same reported income level. If this were established it would support elimination of the present statutory tax differential in favor of the self-employed.

If we depart from the lifetime tax-benefit frame of reference and consider current tax and benefit structures independently some of the above appraisals no longer seem valid. For example, the progressiveness of the relationship between retirement benefits and lifetime income cannot hide the fact that the tax used to finance benefits is heavy and regressive now, and throughout the earner's working career. Even though the working poor may ultimately get out more than they put in, it does not necessarily follow that the later progressivity of the benefit structure is sufficient to compensate for the prior hardship imposed by the payroll tax. On the other hand, the benefit advantage of women due to lower mortality may well be a progressive feature, but this depends on the assumption that women tend to have lower incomes during retirement. Finally, the extra tax paid by early starters compared to late starters with the same income may be justifiable on the grounds of ability to pay. In any case the separate appraisals of taxes and benefits generally produce different answers from those suggested by the lifetime rates of return.

Also relevant, in addition to these various differentials, is the absolute level of these rates of return on contributions under the pro-

[46] As is true throughout this paper, this point abstracts from the survivor and dependent features of the system. These are less valuable to female earners. On the other hand, women tend to receive higher yields due to less continuous coverage. The point here is simply that women fare better than men due to the mortality factor, other things being equal.

[47] This assessment abstracts from the fact that early starters may tend to have lower incomes and greater unemployment and thereby receive favorable treatment due to other features of the system. The point is that an early start, other things equal, yields unfavorable treatment.

gram. First, consider the aggregate or overall yield to participants as a whole. No explicit estimates have been made of this aggregate yield, but a glance at table 5 suggests that it is probably on the order of 4 percent.[48] This rate of return is not inconsistent with the implication of Aaron's simple model.[49] His analysis, like the present one assumes a fixed exponential growth rate, benefits keeping pace with earnings and pay-as-you-go; however, he adds the further simplifying assumptions that population grows exponentially and the active and retired population remain in fixed proportion. Under these conditions he establishes that the approximate condition for a break-even tax/benefit ratio of unity is that the real rate of interest equals the sum of the growth rates of per capita earnings and population. Putting the earnings growth rate at 2.5 percent and assuming a growth rate in the work force of 1.3–1.7 percent,[50] the Aaron model would also imply an overall real yield on contributions of around 4 percent. This provides rough confirmation of the more detailed analysis above, which took into account demograhpic projections. The empirical results for specific earner categories, displayed in chart 2, are also roughly consistent with Aaron's basic relationship.

It is not easy to evaluate an overall projected rate of return on social security contributions of 4 percent. It has been suggested via chart I that this yield is very attractive compared to past experience with fixed dollar claims; it would probably also look good in comparison with the *real* yield on an installment purchase of a private insurance annuity. However, these are all dwarfed by past long-run yields on equity. It is even more difficult to evaluate the projected 2.5-percent earnings growth rate and 1.5-percent work force growth rate which are fundamental to the 4-percent projection. In any case, it should first be acknowledged that a comparison of the 4-percent projection with the yield on equity is artificial in some respects. A public retirement scheme comparable to such a private plan as that developed by the Teachers' Insurance and Annuity Association, which provides for equity investment,[51] is not feasible under a pay-as-you-go system. The present active population would not only have to finance pensions for the currently retired, but also would contribute to a mammoth equity trust fund. Furthermore, there is no reason to believe the high real yields earned on equity in the past would be impervious to the large new demand for securities which would be generated. The bidding up of price-earnings ratios (while cutting dividend rates) would probably yield real capital gains at the outset, but a highly unstable situation would be in prospect as selling of equities by the retired population began to offset buying on behalf of earners.

As a substantial improvement on the past yields on fixed claims a 4-percent real return under a pay-as-you-go social security program

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[48] This rough approximation compromises midway between the two growth rates but weighs heavily the results for starting age 18 and beneficiaries not eligible for wife's benefits.

[49] Henry Aaron, *op. cit.*, pp. 371–74.

[50] This is the range of growth rates in the low-cost and high-cost projections by the Social Security Administration, for the intervals 1965–2000 and 1965–2025, *Actuarial Study No. 63, op. cit.*, p. 24.

[51] As of Jan. 1, 1967, participants in TIAA were permitted to allocate up to 75 percent of contributions in their name to the college retirement equity fund.

seems tolerable for provision of the basic retirement floor. This avoids the uncertainties connected with a funded equity program and permits retention of some generally acceptable redistributive features not likely to survive the more precise individual earmarking to be expected under funding. On the other hand the larger this compulsory saving under social security the less earners will be able to invest privately in mutual funds or other devices for periodic investment in higher yielding equity capital. This consideration is at least relevant to determination of the optimum size of the social security program.

It is essential to stress, also, that the 4-percent yield itself is hardly a riskless proposition. Aside from the fallible growth rate projections, there is not at present any guarantee that benefits will keep pace with earnings as postulated in the present model. The social insurance package would look more attractive if the taxpaying population were guaranteed that the future earners would pay enough to allow their retirement income to keep pace. In the absence of such assurances, younger workers are likely to be more impressed by Colin Campbell's analysis of existing and proposed tax and benefit schedules than by the hypothetical projections of the model discussed here. The raw deals he portrays cannot be ruled out without a public commitment to tie current benefits to current earnings indefinitely. Without such guarantees continued grumbling by younger workers can be expected.

The lack of intergenerational contractual obligations is not the only ground for discontent on the part of social security taxpayers, however. Although there is a modest degree of progression in the yield-earnings relationship, the yields at the low end of the income scale are probably highly unattractive to the poor. Low-income families frequently choose, or are compelled, to borrow at very high interest rates. It is, therefore, difficult to justify forcing them to save, even at a real interest rate of 7 percent under social security; they may at the same time (and in part as a consequence) be borrowing at 36 percent or more. In the context of a war against poverty it is an anomaly that a 10-percent combined employer-employee payroll tax is collected on a $2,500 income of a family of four even though this family is recognized as incapable of paying any income tax. The payroll tax is regressive because of the earnings ceiling and especially burdensome to the working poor who get little offsetting help from welfare. Whatever the ultimate payoff at age 65, the magnitude of this compulsory saving can hardly be regarded as trivial by workers living in an income range we have defined as poverty.

It seems appropriate to accept as a working hypothesis that the young poor family discounts its projected retirement income at a very high rate. A 6 or 7 percent ultimate real yield on the 10-percent contribution paid by the young $2,500 earner may sound attractive to some policymakers, but who would presume to call this worker a profligate glutton if he would rather have the 10 percent *now?*

The import of this reasoning is not that participation in the social security program should be made voluntary; this would have the virtually certain result that many people would reach retirement age with few resources and poor prospects. Rather, the heavy and re-

gressive burden of the present payroll tax structure on the working poor deserves recognition and alleviation. Despite the durability of the "insurance principle" the present tax-benefit package is already progressive and can be made more so by reforming the payroll tax. One proposal already receiving attention calls for financing part of the social security program out of general revenues. However, this would not eliminate the taxation of poor families. This could be accomplished by a more far-reaching measure which would allow the payroll tax to be credited against the income tax and include refunds in cases in which the payroll tax was the larger. As a more modest alternative the payroll tax itself could be graduated. An attractive and less far-reaching reform aimed simply at ending this taxation of the poor would be institution of exemptions under the payroll tax. Appropriate exemptions would be those implied by the currently reigning definition of poverty. Some other countries have already moved a step in this direction by including a taxable floor in addition to a ceiling. The exemption device would be more equitable because of its allowance for family size and structure.

Since consideration is already being given to raising the taxable ceiling, this would seem an ideal time to introduce exemptions. Part of the loss in revenue due to exemptions could be recouped by a higher ceiling and the rest by a higher rate on the reduced base. Exemption each year of some portion of everyone's income from the tax base used in computing the tax on both employees and employers would eliminate a substantial tax on people we have already designated as poor, even before they pay the tax. It would even make the effective tax rate mildly progressive among incomes below the taxable maximum. It is true that this policy would move social security financing somewhat further away from the "contributory principle" long advocated by social security specialists. However, the connection between individual payments and benefits is already extremely tenuous in the present system, and this does not appear to have weakened the program. The main advantages claimed for the contributory principle can be achieved simply by keeping aggregate payments abreast of aggregate benefits.

The present system already recognizes that some covered workers should not be taxed at all during a given year. A worker unemployed through disability or otherwise for an entire year pays no tax, but will ordinarily lose no retirement benefits. The exemption device would simply extend the exemption level from zero income to the poverty level. In deference to the "contributory principle," it might be desirable to retain a token contribution in the exemption range, but at a rate more like 1 percent than the current 10 percent. In any case the main point is that families found to be in poverty should not be forced to contribute substantially even though their projected return under social security may appear attractive to others more fortunately situated in the income distribution.

In conclusion it should be reiterated that the projected yields, reported above, are based on an abstract model of earnings and benefit growth that is no more than a rough approximation of past reality. If the model and the official demographic projections are fairly realis-

tic, new contributors will, in the aggregate, get neither a very good "buy" nor a very bad one, but will fare moderately well. The evaluation of the redistributive features of the system is more subjective and depends upon whether one thinks in terms of lifetime rates of return, or separate tax and benefit structures. From either viewpoint, however, a guarantee that benefits will keep pace with earnings, and the alleviation of the burden of the payroll tax on the poor would contribute to making social security a substantially more attractive institution.

ON THE OPTIMAL MIX OF SOCIAL INSURANCE PAYMENTS

BY DAVID DONALDSON*

1. INTRODUCTION

Social insurance (and transfer) payments can be made in several different ways. They can be simple cash payments (such as old age pensions), payments in kind (medical care and job retraining programs), subsidies on specific goods (food stamp programs and bus fare subsidies) and payments in real terms, adjusted for unforeseen price level changes (the Canada pension plan).

This note attempts to provide a partial discussion of the desirability of these kinds of payments in different situations. Sociological considerations are not included, though it is recognized that they may be very important. Furthermore, paternalistic arguments are ruled out, and consistent preferences by families are assumed.

No distinction is made here between social insurance and transfer payments. Virtually all the payments that we call transfers are also a form of social insurance. Relief payments provide insurance against income loss; payments to the blind and disabled provide insurance for those born normal, and insurance for all parents. Different public programs will have different effects, however, on the distribution of lifetime income.

2. INSURANCE IN THE PERFECT MARKET

When economists admit uncertainty into their models, the number of markets necessary to guarantee "optimality" [1] expands enormously. Instead of a market for each good in each period of time and the capital market, additional insurance markets that cover every possible risk and uncertainty that people encounter are necessary. Insurance contracts would not only be against monetary losses but would provide cash payments on the occurrence of any uncertain event. If provision of the insurance market has a real cost in economic resources, then insurance should not cover all uncertainties, but only the ones in which the "benefit" exceeds the cost.[2]

The insurance market is, however, very poorly developed. This can be explained by several things, among them incentive effects of insurance (see below), lack of information available to insurance companies

*Professor, University of British Columbia, Vancouver, B.C., Canada.

[1] By "optimality" we mean a Pareto optimum—a situation where a given family can be made better off only at the expense of others. There are many optimal situations, corresponding roughly to different distributions of lifetime income.

[2] For a more detailed discussion of these assertions see references 1, 2, 3, and 4.

and individuals, the pooling of unequal risks, and economies of scale in group insurance. Some of this is offset by the provision of social insurance in areas where the market fails.

3. The Effects of Different Types of Payment in the Perfect Market

In the perfect market, described above, payments made as cash, kind, or subsidy will have no difference whatever on the family receiving it if the family is consistent in its preferences. The assumption of the perfect market allows anyone to sell anything received in kind at the going market price; consequently, the payments in kind or subsidies have no different effect from cash payments. Even in the case of compulsory insurance for old age there will be no effect other than a change in lifetime income. Any purchase of insurance for old age can be "sold back" at the market price, and the only effect of the plan will be a redistribution of income resulting from the difference between market and government prices. The way in which old-age insurance can be "sold back" is as follows: Life insured loans are made for the market value of the premiums; if the individual dies before retirement, there is no debt; if he retires, his pension will just pay off the loans.

It is obvious, therefore, that policy decisions with regard to subsidies, or payments in kind must take imperfections into account explicitly. In the normal world opportunities for "selling back" either do not exist at all, as in the case of personal services such as medical care, or exist only at a lower price than the buying price because of the costs of providing insurance and other markets. In these cases there will be a great deal of difference in final consumption patterns, depending on the mix of the various types of payments.

4. Incentive Effects

Insurance contracts may carry with them incentives that change the behavior of those insured so that the expected gain is increased. For example, fire insurance provides an incentive to carelessness and arson; divorce insurance would, if provided, tend to increase the divorce rate of those insured; unemployment insurance may affect the effort expended on finding a new job.

These have the effect of either making a given insurance market smaller or eliminating it altogether. Consequently, there is a good argument, in these cases for social intervention. Social insurance cannot, however, merely provide insurance with cash benefits, copying the private sector. The incentive effects do not disappear. It can, however, provide or subsidize benefits in kind (usually services) that cannot easily be sold by the recipients, and that compensate for the incentive effects of providing the insurance. Examples of social insurance of this kind are job retraining programs for young and old, marriage counseling services, and training programs for the blind and disabled.

Incentive effects of a slightly different kind are present in old-age pension plans in the United States and Canada and in many relief

programs for the indigent. In early retirement and in almost all relief programs, earning income reduces the amount of the payment from the Government. This provides an incentive against working which may lead to large social losses, especially in the case of younger people on relief. The effect is easily eliminated in the old-age case: part of the pension can be postponed until actual retirement and then increased over the usual amount to compensate the working old person for the earlier loss. In the case of relief payments, the solution is not so easy. Some work has been done on the possibility of incorporating relief and other payments into the tax system (with negative income taxes being "paid" by some), and this holds a great deal of promise for solving this problem.[3]

5. Costs of Market and Social Insurance

In the perfect market, as shown above, neither the form of insurance payments nor the timing will affect the rational consumer at all as long as the market value [4] of his lifetime income is not affected. This theorem depends, however, on the assumption that goods and services can be resold, and that all market transactions are costless. In fact, however, market transactions are not costless, and if the Government tries to minimize these costs, it will find itself providing insurance, and may find itself making payments in kind, when it wants to change the distribution of income. If people do buy insurance for old age, disability, sickness, and so on, Government transfers should (at least in part) be provided in transfers to the old, disabled, and sick. Furthermore, if most sick and disabled people want to purchase medical care, and if purchases of medical care have real costs (purchasers' as well as administration costs), medical care should be provided directly if these costs can be substantially reduced without affecting quality.

6. Uncertainty About Prices

The optimality theorems discussed in section 2 assume that all future prices are known. If they are not, then the appropriate way to provide general insurance for old age is to provide a real income; that is, to adjust the benefits year by year for changes in the consumer price level. This is now being done by the Canada pension plan. A companion policy to that one would be provision of Government bonds in real terms. These would be of direct benefit to savers who want insurance against inflation, and to the private insurance market which could offer many contacts in real terms.

Medical care provided by insurance (rather than cash payments in the event of sickness) is also required by these considerations. Medical prices may change independently of general prices, and consequently, a good way to provide sickness insurance in real terms is to provide either the care itself or to guarantee payment (whatever it is) for the necessary care.

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[3] See reference 5.

[4] When dealing with lifetime income in an uncertain world, it is necessary to use a slightly different concept of lifetime income. Normally we use present value, but in uncertain conditions, uncertain incomes are converted to a present value by using prices of insurance contracts instead of simple bonds.

7. Other Considerations

Some things that receivers of social insurance payments want have public-good aspects. A good example of this is social centers for the aged. These should, therefore, be provided free or subsidized.

An interesting argument for providing goods in kind as benefits of social insurance programs applies to the case of social insurance directed at children and dependent wives. Since husbands cannot always be counted on to act in the interest of the rest of their families, benefits provided in kind which cannot be sold are appropriate in these cases. School lunch and food stamp programs are obvious examples.

8. Conclusion

It is clear from the above discussion that there are a great many cases when the economist's rule that cash is best breaks down, even under his usual assumptions of nonpaternalism and consistent preferences. The reason for this is the fact of great and important imperfections in the insurance market.

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MATHEMATICAL APPROACHES TO THE MACROECONOMICS AND PLANNING OF OLD-AGE PENSION SYSTEMS

BY RICHARD D. YOUNG and GASTON V. RIMLINGER*

I. INTRODUCTION

The American social security system has become a vast undertaking which affects the present or future welfare of nearly every citizen. By the end of 1965 over 163 million people had been issued social security account numbers. Today OASDHI is paying benefits to some 23 million people and collecting contributions from about 70 million employees and self-employed persons. Most striking is the fact that over the last 15 years income and expenditures of social insurance have risen over twice as fast as gross national product.[1] Macroeconomic magnitudes of this order inevitably raise questions about the long-run stability of the system. It is obvious, for example, that social insurance expenditures cannot indefinitely increase faster than the gross national product. Much less obvious, however, is the rate of benefit increase that can be sustained in the long run and the characteristics of a plan consistent with this rate. The objective of this paper is to work out mathematical approaches that may assist social security planners in dealing with such problems in a rigorous analytical manner.

The question of permanently sustainable increases, or in a more general sense of permanently sustainable rates of benefits, is highly important because of its obvious policy implications. It involves both micro and macro economic issues. The micro issue has to do with the proportion of current income individuals are willing to forgo for the sake of future pensions. In this paper we will not be able to deal with this issue.[2] The macroeconomic problem is concerned with the rates of benefit and contribution that are consistent with such macro variables as the growth of national income and of the work force. We are primarily concerned with this bundle of problems.

One aspect of these problems involves the solvency and burden of social security. Since the inception of the social insurance program, critics have raised doubts in the popular mind about its solvency and issued ominous warnings about its ultimate burden. There seems to be implicit in such warnings the view that later generations will bear

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[1] For data, see Social Security Bulletin, Annual Statistical Supplement, 1965.

[2] For a theoretical treatment of this problem, see Gaston V. Rimlinger, "A Theoretical Integration of Wages and Social Insurance," Quarterly Journal of Economics, vol. LXXVII, August 1963, pp. 470–484.

a heavier contribution burden in relation to benefits than earlier generations. Students of social insurance answer the question about solvency by pointing out that in a public insurance program there is no need to provide actuarial reserves against future contingencies. These are met from future income. But this means that the relationship between contingent benefits and future taxable income is of crucial importance. This relationship leads directly to the question of benefit versus burden for succeeding generations.

We shall assume that in order to be sustainable, the rates of contribution and benefit must not only adequately meet the needs of the present generation of beneficiaries, but that they must also meet the needs of each succeeding generation, and at the same time they must avoid allowing one generation to become a net burden on another. In other words, we need to devise an old-age pension plan that meets the criteria of both social adequacy and intergenerational equity. We use this concept of equity to mean that each generation is entitled to benefits equal to the interest compounded value of its own contributions.[3] The benefit increases which are consistent with this plan, assuming they are also consistent with wage-pension preferences, can be considered sustainable increases.

We need to recognize at the outset the likelihood of incompatibility of our dual criteria of social adequacy and intergenerational equity. Only in an ideal world with continuous and invariant changes is there some assurance of compatibility, but not in a world subject to fluctuations in earning and employment levels. To deal with the uneven empirical environment our best alternative is to work out a plan which enables us to minimize deviation from established criteria. In this paper we approach this problem in two steps. First, we develop a mathematical model that generates sustainable rates on the assumption that there is no conflict between social adequacy and intergenerational equity. Second, we introduce a linear programing model which enables us to minimize the disutility stemming from shortrun inconsistency between the two criteria. In section V we shall argue that planning based on the linear programing model establishes, among other benefits, an improved medium for the application of the research efforts of social scientists to the planning problems of the social security system. Before turning to these models, we shall present, in the following section, the basic features of our pension plan and the main assumptions of the analysis. For the sake of analytical simplicity we have abstracted from many aspects of the real world, and we have deviated in important respects from the structure of the existing old-age pension system. These abstractions and deviations, however, do not affect the general theoretical objectives of this analysis.

II. Structure of the Pension Plan

Our mathematical models are restricted to old-age pension plans. We deal only with primary beneficiaries and do not take into account their dependents. Nor are we directly concerned with survivorship

[3] The conflict between equity and social adequacy can exist on both intragenerational and intergenerational levels. We do not deal with intragenerational (intracohort) redistributions of benefits, which can be treated separately from questions of intergenerational redistribution and equity.

benefits for widows, orphans, or other dependents. The plan analyzed below is financed completely from contributions, without any governmental subsidies. All contributions are credited to particular workers and serve as the basis for benefit calculations. We assume that these contributions represent the burden of the worker, even though employers may pay part of them. The contribution is calculated as a percentage of his total wage or salary. At any point of time this percentage is the same for all covered individuals, but it may increase or decrease over time. Benefits are treated in a special way in our model in that they are payable in a lump sum at the point of retirement. We make this assumption for analytical purposes. This lump sum can readily be translated into a paid-up annuity and actual payment can be made in the form of monthly benefits, or in any other way. We shall not, however, concern ourselves with this feature.

The eligibility conditions of our plan are very simple. An individual becomes entitled to benefits after he has spent a specified number of years, g years to be exact, in covered employment. It is assumed that the entire work force is occupied in covered employment and that all workers retire as soon as they become eligible. Another assumption we make is that there are no deaths during the working span, so that all workers who earn benefits could collect all of their benefits, regardless of how long they live after retirement.

Our analysis is concerned with a plan that has been in existence long enough to be fully matured, meaning that all current beneficiaries have contributed over g years. We focus our attention on the cohort of individuals entering the system at a given point or period of time. For the sake of convenience we may think of the cohort as representing all individuals entering the system in a given year, although in the limiting case the entry time interval could be reduced so that cohorts represented single individuals. After g years, all individuals in a cohort retire and become entitled to a pension based on previous contributions. The pension system makes a lump-sum payment to the entire cohort. Then the payment is presumably converted into annuity income and other benefits that are distributed among members of the cohort. This conversion of the lump-sum payment into individual benefits may well invlove intracohort redistribution designed to insure that the minimum retirement income in the cohort meets social adequacy criteria. We shall not examine the details of this redistribution. In our model all members of a cohort stay employed continuously once they have entered covered employment. This enables us to treat each cohort as a unit for contribution and benefit calculation.

In the mathematical formulation of our pension system there are two sets of variables which have to be solved for (1) the schedule of tax rates, and (2) the schedule of lump-sum benefit payments due each cohort at retirement. These variables are to be determined so that they satisfy the objectives of the social security system. In our mathematical models, these objectives, or criteria, take on the nature of constraints. Our main general constraints are the following:

A. *Social adequacy.*—Benefit levels should be sufficient to provide retirement income that is no lower than a specified minimum.

B. *Equity.*—The relationship between contributions and benefits should be compatible with accepted standards of social justice. This

criterion is susceptible to various interpretations. As indicated earlier, we use it to mean benefits of each cohort are equal to its contributions plus interest.

C. *Solvency.*—The system has to generate sufficient contributions to pay all benefits and administrative costs when these are due. It does not accumulate reserves or incur debts in the long run.

D. *Administrative simplicity.*—Contributions and benefits should be easy to understand, compute, and predict.

E. *Stability.*—The contribution rates should be sustainable in the long run, which means that the system should not require or imply a tax rate that increases beyond reasonable limits at any future time.

Certain other assumptions and characteristics of our models may be stated at this point. We take the macroeconomic variables, such as the growth of income and of population as given, and we do not take into account any impact of social security on these variables. Our models are deterministic in the sense that all relevant aspects of the future are assumed to be known except benefits and contributions.

III. A Mathematical Model of a Permanently Self-Sustaining System

In this section we develop a continuous model of a social security system. Although this model has serious limitations, it leads to useful insights and hypotheses on the nature of the set of solutions to our problem of deriving a social security system that satisfies the constraints A through E.

We assume the following data are given:

$g \equiv$ The working lifetime.

$w(t,n) \equiv$ The wage rate at time t for workers that have been in the work force for n time units. This function is defined and continuous for all $t \geq 0$ and all n in the interval $0 \leq n \leq g$.

$D(t) \equiv$ The rate of entry into the work force at time t. This function is defined and continuous for all $t \geq 0$.

$\alpha \equiv$ An interest rate used to relate social security contributions to benefits.

The requirements B, C, and D are implemented as follows:

B. *Equity.*—We set the lump-sum payment to the cohort that retires at time t equal to the total contribution made by this cohort during its working lifetime plus interest continuously compounded at the rate α.

C. *Solvency.*—We require that the total (tax) revenue of the social security system at time t be equal to the lump-sum benefit paid to the cohort that retires at time t.

D. *Administrative simplicity.*—We require that the social security tax rate at time t, which we define as $r(t)$, be charged against all income from work at time t.

These assumptions, together with specified initial conditions are enough to determine the social security tax rate $r(t)$ for all $t \geq g$. We note the specific absence of the social adequacy condition among those above that are sufficient to determine the tax rate schedule $r(t)$. We note also that the tax rate schedule $r(t)$ is sufficient, together with the equity condition, to determine the schedule of lump-sum benefit payments.

We shall now develop the mathematical model.[1]

The total income of the social security system at time t (for $t \geq 0$) is given by

$$\int_0^g w(t,x)D(t-x)r(t)dx. \tag{3.1}$$

The lump-sum payment due the cohort that retires at time t is (for $t \geq g$) given by

$$\int_0^g w(t-g+x,x)D(t-g)r(t-g+x)e^{\alpha(g-x)}dx. \tag{3.2}$$

We assume (3.1) and (3.2) are equal for each $t \geq g$. Thus,

$$r(t) = \frac{D(t-g)\int_0^g w(t-g+x,x)r(t-g+x)e^{\alpha(g-x)}dx}{\int_0^g w(t,x)D(t-x)dx}. \tag{3.3}$$

From (3.) it is apparent that the tax $r(t)$ is defined in terms of the tax rates $r(t-k)$ where $0 < k \leq g$—in other words the tax rate at the instant of retirement depends on all the tax rates prevailing during the working lifetime of the retiring cohort.

It is also obvious, if we have a given function $r(k)$, for $0 \leq k < g$, that equation (3.3) completely defines $r(t)$ for all $t \geq g$. The function $r(k)$, where $0 \leq k < g$, represents in our model an arbitrary set of starting conditions for the system. We only restrict this function to being positive and continuous. Now given an arbitrary $r(k)$ $(0 \leq k \leq g)$ we might seek a function $r(t)$ that solves (3.3) for all $t \geq g$. This function would be the unique schedule of tax rates that satisfies our requirements (equity, solvency, and administrative simplicity), and is consistent with the given initial conditions. But this solution or tax rate schedule would reflect the influence of the arbitrary initial conditions, in which we have no immediate interest.[2] We are more interested in deducing common characteristics of all tax rate schedules $r(t)$ $(g \leq t \leq \infty)$ that derive from (3.3) and some arbitrary set of initial conditions. These characteristics would presumably reflect the intrinsic influence of the equity, solvency, and administrative simplicity restrictions of the system.

To deduce these common characteristics we make specific assumptions about the form of the functions $w(t,r)$ and $D(t)$. These assumptions are adopted because they are mathematically tractable and because they have been widely used in models dealing with economic growth.[3]

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[1] The model we develop has considerable (an inevitable) common ground with various consumption loans models that have appeared in the economics literature. See, e.g., David Cass and Menahem E. Yaari, "A Re-examination of the Pure Consumption Loans Model," the Journal of Political Economy, vol. LXXIV, No. 4, August 1966, pp. 353–367.

[2] In the appendix to this section we deal briefly (and somewhat elliptically) with the relation of initial conditions to the resulting function $r(t)$ $g \leq t \leq \infty$.

[3] See Edmund S. Phelps, "Golden Rules of Economic Growth" New York, W. W. Norton, 1966.

We assume that the rate of entry into the work force, $D(t)$ satisfies the following relation:

$$\frac{dD(t)}{dt}=\pi D(t). \tag{3.4}$$

This implies

$$D(t)=D_0e^{\pi t}, \tag{3.5}$$

where D_0 is a given constant. The parameter π is also the percentage growth rate of the labor force.[1]

We also assume that wages are governed by a constant percentage growth rate; i.e.,

$$\frac{\partial w(t,x)}{\partial x}=\gamma w(t,x),$$

which implies

$$w(t,x)=e^{\gamma t}.w(x) \tag{3.6}$$

where $w(x)$ is a given positive and continuous function[2] of x for $0\leq x\leq g$.

Now, after substituting into (3.3) on the basis of (3.5) and (3.6) we get

$$r(t)=\frac{D_0e^{\pi(t-g)}\int_0^g w(x)e^{\gamma(t-g+x)}r(t-g+x)e^{\alpha(g-x)}ds}{\int_0^g w(x)e^{\gamma t}D_0e^{\pi(t-x)}dx}. \tag{3.7}$$

---

[1] Define:

$P(t)=$ Total work force at t.
$B(t)=$ Cumulative entries in the work force at t.
$E(t)=$ Cumulative departures from the work force at time t.

Then

$$P(t)=B(t)-E(t),$$

and since

$$E(t)=B(t-g),\ P(t)=B(t)-B(t-g).$$

We assume

$$\frac{dB(t)}{dt}=\pi B(t).$$

This implies: (i)

$$B(t)=B_0e^{\pi t},$$

and

$$\frac{dB(t)}{dt}=\pi(B_0e^{\pi t})=(\pi B_0)e^{\pi t};$$

since

$$D(t)=\frac{dB(t)}{dt}$$

we have

$$D(t)=D_0e^{\pi t}$$

where

$$D_0=\pi B_0;$$

and (ii)

$$\begin{aligned}\frac{dP(t)}{dt}&=\frac{dB(t)}{dt}-\frac{dB(t-g)}{dt}\\&=\pi B(t)-\pi B(t-g)\\&=\pi(B(t)-B(t-g))\\&=\pi P(t).\end{aligned}$$

[2] $w(x)$ is a function that gives the wage rate for each cohort, x, where $0\leq x\leq g$. This is a profile of wages versus time in the work force. The entire profile inflates at the percentage rate γ. One of the results of this model is that the stability of the social security system does not depend on the shape of the profile $w(x)$.

This may be rewritten as follows:

$$r(t)=\frac{D_0e^{\pi(t-g)}e^{\gamma t}\int_0^g w(x)e^{\gamma(x-g)}r(t-g+x)e^{\alpha(g-x)}dx}{D_0e^{\gamma t}e^{\pi t}\int_0^g w(x)e^{-\pi x}dx}$$

$$r(t)=\frac{e^{g(\alpha-\gamma-\pi)}\int_0^g w(x)e^{-(\alpha-\gamma)x}r(t-g+x)dx}{\int_0^g w(x)e^{-\pi x}dx}. \tag{3.8}$$

After defining $K=\alpha-\gamma$ we rewrite and rearrange (3.8):

$$0=r(t)\int_0^g w(x)e^{-\pi x}dx-e^{g(K-\pi)}\int_o^g w(x)e^{-Kx}r(t-g+x)dx$$

$$0=\int_0^g w(x)e^{-Kx}\{r(t)e^{(K-\pi)x}-e^{(K-\pi)g}r(t-g+x)\}dx. \tag{3.9}$$

We have a solution if the term in braces in (3.9) is zero for every x. This implies

$$r(t)e^{(K-\pi)x}=e^{(K-\pi)g}r(t-g+\alpha)$$
$$r(t)=e^{(K-\pi)(g-x)}r(t-g+x).$$

Thus

$$r(t)=R_0e^{(K-\pi)t} \tag{3.10}$$

is a function that solves (3.9), (3.7), and (3.3) (with appropriate initial conditions).

More significantly, it can be shown that any set of initial conditions will determine a tax rate schedule $r(t)$ that satisfies the following inequalities:

$$R_Le^{(K-\pi)t}\leq r(t)\leq R_Ue^{(K-\pi)t} \tag{3.11}$$

where

$$R_L\leq R_U.$$

This result has applied implications. Recall that $K=\alpha-\gamma$, so that $K-\pi=\alpha-\gamma-\pi$. If $\alpha>\gamma+\pi$ then $K-\pi>0$. If this inequality holds then $R_Le^{(K-\pi)t}$ will increase exponentially and eventually surpass any finite upper limit. Since $r(t)\geq R_Le^{(K-\pi)t}$ $\alpha>\gamma+\pi$ implies that $r(t)$ will increase without bound. Hence, $\alpha>\gamma+\pi$ is inconsistent with the stability constraint.

By a symmetric argument it is apparent that if $\alpha<\gamma+\pi$ then $K-\pi<0$ and $R_Ue^{(K-\pi)t}$ will asymptotically approach zero. Since $r(t)\leq R_U{}^{(K-\pi)t}$, this implies that collection rates and benefits will eventually become trivially small. While this might be consistent with absolutely increasing benefits, it remains probable that $\alpha<\pi+\gamma$ is inconsistent with the social adequacy requirement. Thus our model strongly suggests that the only appropriate longrun rate of interest is

$$\alpha=\gamma+\pi. \tag{3.12}$$

$\gamma+\pi$ is also the percentage growth rate of total wage (or covered) income.[1] Hence, the interest rate used to equate benefits and contributions should be equal to the percentage growth rate of total wage income. This is a necessary condition for satisfaction of the constraints regarding social adequacy, equity, solvency, administrative simplicity, and stability as interpreted in this model.

This result has many interesting normative implications. We retain unresolved skepticism regarding the generality and applicability of the model from which (3.12) was derived, and accordingly our discussion below is predicated on the assumption that (3.12) will emerge essentially unscathed from a more general and comprehensive analysis. Bearing in mind the possibly speculative character of our comment we list several implications of (3.12):

1. Total benefits paid by the system should increase at the rate $\pi+\gamma$. Specifically there is no problem of instability if lump-sum benefit increases do not exceed the percentage rate $\pi+\gamma$, which is the combined growth of the wage rate and of the work force.

2. The "obligation" of the system—i.e., the present value of the total "debt" of the system to the working generation—should in the long run increase at the percentage rate $\pi+\gamma$.

3. Any equity rule that systematically pays more or systematically pays less in benefits than total contributions plus interest at the rate $\pi+\gamma$ will be either unstable or socially inadequate in the long run.

4. The status of social security as an alternative to private provision of retirement income depends on the relation of $\pi+\gamma$ to the "riskless" lending interest rate. If this market rate is systematically below $\pi+\gamma$, then social security may offer a better alternative than private savings per dollar invested as a means of providing for retirement income. This would provide a new justification for social security. If the market lending rate were systematically above $\pi+\gamma$ then a corresponding (per dollar) cost of social security both exists and is calculable. We take no position on this issue here;[2] we merely note the existence of the question.

Now we turn to one of the deficiencies of our model. While the condition $\pi+\gamma=a$ is apparently necessary for a pension system satisfying all requirements, it is not sufficient. Specifically there is no guarantee that the schedule of lump-sum benefits provided by the system will be socially adequate, particularly in the short run.

Whether a lump-sum payment is or is not adequate depends on a number of issues—some technical, and some questions of political and social policy—that we have deliberately avoided in this paper. We are content here to assume that a well-defined procedure exists for trans-

[1] Total income at time $t=Y(t)$:

$$Y(t)=\int_{t}^{\infty}[w(x)e^{\gamma t}]D_{o}e^{\pi(t-x)}dx$$

$$Y(t)=e^{\gamma t}D_{o}e^{\pi t}\int_{t}^{\infty}w(x)e^{-\pi x}dx$$

$$Y(t)=Ke^{(\gamma+\pi)t},$$

where

$$K=D_{o}\int_{t}^{\infty}w(x)e^{-\pi x}dx.$$

[2] The equality of the interest rate with $\pi+\gamma$ is a result of normative significance in a number of economic models. (See, e.g., Phelps, op. cit., pp. 10–11.)

forming a lump-sum benefit at the instant of retirement into a time path of benefits for each member of the cohort over his retirement years. Then we assume it is possible to determine whether the time path of benefits is, for each member, socially adequate. If so, the lump-sum benefit is socially adequate; otherwise it is not. We are not persuaded that the minimum socially adequate lump-sum benefit should increase (with time) at the percentage rate $\gamma+\pi$. Indeed, very casual consideration of such dynamic factors as changing life expectancy suggests that the time path of the minimum benefit would not have a natural harmonious relation to the growth of total wage income. Accordingly we would expect shortrun situations in which the benefits generated by our model are not socially adequate.[1] As a means to dealing with this, and other shortrun problems, we propose a linear programing model in the next section.

APPENDIX TO SECTION III

In this appendix we develop a simple relation between a set of initial conditions and a resulting equilibrium constant tax rate.

Consider the problem posed by the following three requirements:

(i) During a period $0 \leqq t < g$ we require that each cohort retiring at time t be awarded a benefit $V(t)$ equal to the interest-weighted sum of the cohort's contributions from 0 to t plus an amount $f(t)$. The function $f(t)$ is positive and continuous for $0 \leqq t < g$.

(ii) We permit the social security system to borrow and lend at the rate ρ during the period $0 \leqq t < g$ and only require that no debt or loan should be outstanding at $t=g$.

(iii) We seek a constant tax rate r to hold for this period (i.e., $r=r(t)$, $0 \leqq t < g$) that is consistent with (and, in fact, determined by) requirements (i) and (ii).

This problem is easily solved. We have, from (i)

$$V(t)=f(t)+rD(t-g)\int_0^t w(t-g+x,x)e^{\alpha(g-x)}dx \qquad (3A.1)$$

or defining

$$B(t)=D(t-g)\int_0^t w(t-g+x,x)e^{\alpha(g-x)}dx,$$

we have

$$V(t)=f(t)+rB(t).$$

Let revenue at t be denoted by $K(t)$. Then

$$K(t)=r\int_0^g w(t,x)D(t-x)dx$$

and defining

$$A(t)=\int_0^g w(t,x)D(t-x)dx,$$

we have

$$K(t)=rA(t).$$

[1] We recognize that it is possible to generate stable systems with tax rates and benefits sufficiently high to insure minimum socially adequate benefits at all points in time. The problem of solving for a tax rate that is optimal—taking into account social adequacy and the various disutilities induced by higher tax rates—is beyond the scope of this paper. (See above, p. 2.)

From (ii) we have

$$\int_0^g [K(t)-V(t)]e^{\rho(g-t)}dt=0.$$

Hence

$$\int_0^g [rA(t)-f(t)-rB(t)]e^{\rho(g-t)}dt=0$$

$$r\int_0^g [A(t)-B(t)]e^{\rho(g-t)}dt=\int_0^g f(t)e^{\rho(g-t)}$$

$$r=\frac{\int_0^g f(t)e^{\rho(g-t)}dt}{\int_0^g [A(t)-B(t)]e^{\rho(g-t)}dt}. \qquad (3A.2)$$

We can draw several conclusions—heuristically at least—from this result:

(*a*) If $w(t,x)$ and $D(t)$ are specified by (3.5) and (3.6) and if $\alpha=\gamma+\pi$ than it is evident from (3.8) that setting $r(t)=r$ as defined by (3A.2) for $0\leq t<g$ will lead to r as a perpetual constant tax rate. Thus by slightly relaxing the solvency requirement we see that the imposition of exogenous requirements on the system (i.e., the function $f(t)$, $0\leq t<g$) can be accommodated without fluctuations in the tax rate. (3A.2) provides a relationship linking the resultant tax rate to the exogenous stimulus $f(t)$.

(*b*) The assumptions of this analysis are not operationally offensive, particularly if $\rho=\alpha=\pi+\gamma$. It would seem reasonable to substitute a moderate program of short-term borrowing and lending, especially at no net cost, for fluctuating tax rates.

(*c*) The requirement imposed in (i) by $f(t)$ is equivalent to the requirement imposed by starting the system at $t=0$ and assuming that the system as a given "debt" or obligation to each working cohort at $t=0$. Let $0(0,x)$ be the obligation of the system at time zero to the cohort in its xth year in the work force. Defining $f(t)\equiv e^{\alpha t}$. $0(0,g-t)$ we can use (3A.1) to determine $V(t)$ in accordance with the usual rule that benefits equal payments plus interest at the rate α.

IV. A Linear Programing Model

There are several reasons, in addition to those cited in section III, for using linear programing to solve for a social security system. Linear programing considerably extends our ability to solve problems with a wide variety of constraints, including the requirement for minimum retirement income that was "unrepresented" in the calculus model of section III. We can add other constraints besides those that have occupied our attention thus far. We can express a variety of interpretations of the constraints we have considered; solvency, for example, does not necessarily require a continuous exact balance of receipts and expenditures. This ability to vary the mathematical representations of a given category of constraint provides a method of testing, at worst by computational experiments, to determine whether certain characteristics of the system are caused by essential or incidental properties of a given constraint.

The linear programing model will also accommodate arbitrary patterns of wage rate and labor force growth, in contrast to the assumption of smooth exponential growth paths that was required to extract informative results from the model of section III. Thus linear programing adapts well to the mathematically messy details of shortrun empirical data or predictions. More fundamentally the linear programing model provides a framework in which problems of fact and value can be appropriately segregated for the purposes of making an informed resolution of conflicting interests, and appropriately integrated for the purposes of achieving an optimal, articulated plan of action.

We now discuss the formulation of a social security problem. Our goal here is to develop a formulation that is conceptually as close as possible to the model of section III. We shall subsequently discuss some of the many possible elaborations of this elementary model.

In contrast to the calculus model of section III, the linear programming model will deal with a fixed span of time from year 1 through year T. This immediately raises a seemingly new problem: How do we deal with obligations existing at $t=1$ to people in the work force at that time? And how do we account for the unredeemed obligation to people in the work force at the terminal planning date T? Explicit means of dealing with these problems will be discussed presently. In general terms these problems had their counterparts in the calculus model; the first problem is analogous to specifying $r(k)$ for $0 \leq k < g$ and the second is analogous to the stability criterion.

Formally a linear programing problem may be characterized as follows: Minimize

$$Z - \sum_{J}^{n} c_j x_j \tag{4.1}$$

subject to

$$x_j \geq 0 (j=1, \ldots, n) \tag{4.2}$$

$$\sum_{j=1}^{n} a_{ij} x_j \leq b_i (i=1, \ldots, m) \tag{4.3}$$

The inequality in (4.3) is only illustrative and could be oppositely oriented or could be an equality. The x's are the variables and the a's, the b's, and the c's are the data or the parameters of the problem. Thus the social security tax rates $r(t)$, $t=1, 2, \ldots, T$, and the benefits $V(t)$, $T=1, 2, \ldots, T$, will play the role of the x's. And the requirements of the system (A) through (E) on pages 139 and 140 will be expressed as linear restrictions such as (4.3) on the variables.

It is not obvious that the minimization required in (4.1) is pertinent, since there was no minimization involved in the calculus model of section III.

A minimization problem arises, in fact, out of the already cited deficiency of the calculus model: it may not satisfy all the requirements of a social security system. Since the calculus model does satisfy some requirements of the system and these requirements are sufficient to determine a solution, it would not appear generally possible (once the initial conditions are determined) to simultaneously satisfy all requirements. Hence it is appropriate to attempt minimization of a weighted sum of the (inevitable) violations of the various constraints.

Linear programing provides a completely natural and effective means of implementing such a minimization goal. Let a typical restriction be represented by $\sum_j a_j x_j \geq b$. This constraint is routinely converted into an equivalent equation by adjoining a slack variable s: $\sum_j a_j x_j - s = b$. s is required to be nonnegative and can be interpreted as a measure of the overfulfillment of the constraint. It is also possible to adjoin another variable ω to the constraint: $\sum_j a_j x_j - s + \omega = b$. ω is also constrained to be nonnegative and is a measure of the amount by which the solution fails to satisfy the constraint. Variables such as ω are called artificial variables. An artificial variable may be adjoined to each constraint in the model. To minimize the appropriate sum of constraint violations one specifies the constants c_j in (3.1) as follows: Only the artificial variables have nonzero c_j coefficients; and the c_j associated with an artificial variable is a measure of the relative cost (subjective or objective) of a unit violation of the constraint associated with the artificial variable.[1]

To formulate and solve a linear programing version of the social security problem we assume that the following array of known constants is available as basic data:

$w(t,x) \equiv$ Annual wage in year t for the cohort in its xth year in the work force ($t=1, 2, \ldots, T$: $x=1, 2, \ldots, g$).

$D(t) \equiv$ Number of workers in the cohort that enters the work force in year t ($t=1, 2, \ldots, T$).

$y(t,x) \equiv w(t,x)\,D(t-x+1) =$ total wage income in year t for the cohort in its xth year in the work force ($t=1, 2, \ldots, T$: $x=1, 2, \ldots, g$).

The variables for the problem are:

$r(t) \equiv$ The social security tax rate charged in year t against wage income ($t=1, 2, \ldots, T$).

$V(t) \equiv$ The lump-sum benefit payment made to the cohort that retires at the end of year t ($t=1, 2, \ldots, T$).

The model includes the following types of constraints: equity constraints, solvency constraints, social adequacy constraints, and a constraint governing terminal conditions. In the definition of the variables we have implicitly included another constraint reflecting a desire for a simple tax rate structure, by defining tax rate variables as we have, we rule out the possibility of charging different tax rates against different cohorts. We discuss this option later.

We assume that the planning period, $T > g$, the working lifetime.

[1] The final specification of the weights $c_1, c_2 \ldots c_m$ is psychologically easier and procedurally much more complex than our discussion here suggests. Contrary to appearance, the values of $c_1, c_2 \ldots c_m$ can be specified without forcing the decisionmaker into an a priori specification of his utility function over the variables $\omega_1, \omega_2, \ldots, \omega_m$. And the linear form of Z is less restrictive than it appears. Specifying the parameters c_i that define Z amounts to provisionally specifying a tangent hyperplane to an indifference surface rather than the surface itself. A sequence of such provisional specifications leads to final specification of the tangent hyperplane at a utility maximizing point. For details see Bertil Näslund, "Decisions Under Risk (Economic Applications of Chance-Constrained Programing)," doctoral dissertation, Carnegie Institute of Technology, November 1964.

SOLVENCY CONSTRAINTS

$$r(t)\sum_{k=1}^{g} y(t,k) = V(t),\ (t=1,\ 2,\ \ldots\ T). \tag{4.4}$$

SOCIAL ADEQUACY CONSTRAINTS

For each t, $1 \leq t \leq T$, we require

$$V(t) (\geq N(t). \tag{4.5}$$

The simplicity of this set of constraints is somewhat deceptive. $N(t)$ is defined as the minimum lump-sum benefit sufficient to support socially adequate retirement income for all members of the cohort at time t. Thus $N(t)$ is the result of solving an actuarial problem that is constrained by a given policy regarding redistribution within the cohort.

EQUITY CONSTRAINTS

Because the benefits paid in the first $g-1$ years of the timespan from year 1 to year T may involve obligations that were present at the beginning of the timespan, we shall treat these years separately. We let $0(1, x)$, $(x=1,\ 2,\ \ldots,\ g)$, represent an array of given constants that individually denote the present value at the beginning of year 1 of the financial obligation of the pension system to the cohort that is in its xth year in the work force during year 1. For each t, $1 \leq t \leq g-1$ we require

$$V(t) \geq 0(1,\ g-t+1)\alpha^t + \sum_{k=1}^{t} y(k,\ g-t+k)\alpha^{t-k} r(k). \tag{4.6}$$

The constant α used in (4.6) has, of course, the role of an interest rate. The determination of this rate is clearly a matter of social policy. The results of section III, as well as more general considerations, would suggest setting α at the percentage growth rate of total wage income.

For the cohorts that enter the work force during the timespan of our problem, we require that $V(t)$ should be no less than total contributions with interest. Thus, for each t, $g \leq t \leq T$, we require,

$$V(t) \geq \sum_{k=1}^{g} y(t-g+k,\ k)\alpha^{g-k} r(t-g+k). \tag{4.7}$$

TERMINAL CONDITION CONSTRAINT

The terminal condition constraint simply sets an upper limit on the present value at time T of payments to the social security system from cohorts that will retire after time T. This constraint represents the stability requirement in a limited sense. The constraint is a barrier to providing social security benefits in the present that are only consistent with increasing tax rates in the future or with a failure to honor equity constraints in the future.

Defining

$$0(T, x)=\sum_{k=0}^{x-1} y(T-k, x-k)\alpha^k r(T-k), \quad (x=1, 2, \ldots, g-1) \tag{4.8}$$

as the obligation of the system to the cohort that is in its xth year in the work force at time T, the total unredeemed obligation at time T is given by

$$0(T)=\sum_{x=0}^{g-1} O(T, x). \tag{4.9}$$

Our constraint is simply

$$0(T)\leq H. \tag{4.10}$$

This raises two questions:

(i) How is H determined?

(ii) How does this constraint balance the interests of those that retire before and after year T?

Before answering these questions we shall note that without any constraint such as (4.10) the likely result would be a solution implying an unjustifiably large $0(T)$, since the benefits derived from a large $0(T)$ would be enjoyed before T, within the scope of the problem, while the costs of redeeming the debt $0(T)$ would be borne after T, beyond the horizon of the problem. Thus we have bounded $0(T)$ from above.

Analysis of the calculus model indicates that $0(T)$ grows at the percentage rate α. This is consistent with longrun stability of the social security tax rate, if and only if α is equal to the percentage growth rate of total wage income. Thus we would recommend setting

$$H=K\alpha^T \tag{4.11}$$

where K is the obligation of the system at $t=1$; i.e.,

$$K=\sum_{x=1}^{g} 0(1,x)=0(1). \tag{4.12}$$

Without undertaking an analysis that is beyond the scope of this paper, we cannot make definitive claims for (4.11) and (4.12) as a means of preserving intergenerational equity. The idea behind (4.10), (4.11), and (4.12) is that a unique constant tax rate r_1 is consistent with the obligtion $0(1)$ at the beginning of the period; and we assume that r_1 is normative in this sense: an obligation $0(T)$ at T, that is consistent with r_1 represents an optimal balancing of the interests of those that retire before and after T. We emphasize again that determination of an optimal longrun average rate r_1 or an optimal time path $r(t)$ is a problem we do not attempt to solve here. And determination of appropriate terminal conditions must follow from the explicit or implicit solution of such a problem. Hence our terminal constraint is only conditionally normative.[1]

[1] The analysis of the appendix to sec. III is relevant here in two respects. First, the general nature of the connection between the obligation at t, $0(t)$, and a tax rate r for succeeding periods is explored there. Second, the results of that section suggest that (exponential) weights might be appropriately included on the right side of (4.9).

THE OBJECTIVE FUNCTION

We define the slack and artificial variables as follows:

$\omega_1(t) \equiv$ A measure of violation of the solvency constraint (4.4) for period t. $\omega_1(t)$ is positive if the social security tax yield in year t is less than $V(t)$.

$s_2(t) \equiv$ A measure of surplus fulfillment of the social adequacy constraint (4.5) for period t.

$\omega_2(t) \equiv$ A measure of violation of the social adequacy constraint (4.5) for period t.

$s_3(t) \equiv$ A measure of surplus fulfillment of the individual equity constraint (4.6) or (4.7) for period t.

$\omega_3(t) \equiv$ A measure of violation of the individual equity constraint (4.6) or (4.7) for period t.

$s_4 \equiv$ A measure of surplus fulfillment of the terminal constraint (4.10).

$\omega_4 \equiv$ A measure of violation of the terminal constraint (4.10).

We next define $c_i(t)$ as a measure of the cost associated with a unit of $\omega_i(t)$ where $i=1, 2, 3$, and $t=1, 2, \ldots, T$. We define c_4 analogously. Our objective function is: Minimize

$$Z=c_4\omega_4+\sum_{i=1}^{3}\sum_{t=1}^{T}c_i(t)\omega_i(t).$$

SUMMARY STATEMENT OF THE PROBLEM

The entire problem can be stated as follows: Minimize

$$Z=c_4\omega_4+\sum_{i=1}^{3}\sum_{t=1}^{T}c_i(t)\omega_i(t)$$

subject to

$$V(t)\geq 0 \quad (t=1 \ldots T)$$

$$r(t)\geq 0 \quad (t=1 \ldots T)$$

$$\omega_i(t)\geq 0 \quad (i=1, 2, 3;\ t=1 \ldots T)$$

$$s_i(t)\geq 0 \quad (i=2, 3;\ t=1 \ldots T)$$

$$r(t)\left[\sum_{k=1}^{g}y(t,k)\right]+\omega_1(t)-V(t)=0, \quad (t=1 \ldots T)$$

$$V(t)-s_2(t)+\omega_2(t)=N(t) \quad (t=1 \ldots T)$$

$$V(t)-\sum_{k=1}^{t}[y(k,g-t+k)\alpha^{t-k}]r(k)-s_3(t)+\omega_3(t) = 0(1,g-t+1)\alpha^t (t=1, 2, \ldots g-1)$$

$$V(t)-\sum_{k=1}^{g}[y(t-g+k,k)\alpha^{g-k}]r(t-g+k)-s_3(t)+\omega_3(t) = 0 (t=g,g+1 \ldots T)$$

$$\sum_{x=1}^{g-1}\sum_{k=0}^{x-1}[y(T-k,x-k)\alpha^k]r(T-k)+s_4-\omega_4=H$$

COMMENT AND EXTENSIONS

The model we have formulated is meant to demonstrate the possibility of formulation of our social security planning problem as a linear program. Except for introduction of the social adequacy constraints (4.5), we have aimed at keeping the model as simple and as analogous to the calculus model as possible. In this development we have suppressed many possible elaborations. We now list a few of the possible modifications and refinements that can be added to the linear programing model.

1. The tax rates may be varied between cohorts in the same year. This would lead to an expanded set of variables $r(t,x)$ $(t=1 \ldots T;$ $x=1 \ldots . g)$. It appears likely that such expansion of the set of variables would entail additional constraints limiting the variability of social security tax rates. It also appears likely that allowing a more varied tax rate structure would reduce violation of the other constraints. It is also possible, and possibly desirable, to constrain the variability of tax rates over time in a model in which the tax rate only varies with time.

2. The solvency constraint can (and should) be relaxed to permit temporary surpluses and deficits. This can be accomplished easily within the linear programing framework.

3. The equity relation can be expressed in a variety of forms. For example, the retirement benefit can be related to average income, average income over the last k years in the work force, or average income over the k years of highest wages. Linear programing will accommodate all these possibilities.

We believe, however, that relating benefits to total interest-weighted payments has several advantages in addition to those cited in section III. It permits straightforward comparison of social security with other means of providing for retirement income, and it permits the development of simple relations between the social security interest rate and natural economic and demographic parameters.

A related use of the linear programing model is to analyze and compare various benefit formulas (such as, for example, those mentioned above) with the interest-weighted contributions under various assumptions as to the growth of wages and the work force.

4. It is possible to include constraints establishing an upper limit on the total individual contribution to the social security system and/or an upper limit on the social security tax rate.

5. The model might be expanded to include detailed representation and control of the process of providing annuity income to the retired population.

6. In case it were possible to satisfy all constraints, our objective function would not be a useful means of achieving a best schedule of rates and benefits. This difficulty can be resolved by expanding the objective function to include nonzero (and normally negative) c_i coefficients corresponding to the slack variables, $s_i(t)$, $(i=2, 3;\ t=1, \ldots, T)$.

These coefficients could also be meaningfully introduced into the objective function in cases where some artificial variables are positive in an optimal solution. For example, it might be socially desirable to have a larger terminal obligation 0 (T) than that permitted by (4.10).

This could create the opportunity for surplus fulfillment of some of the constraints (4.5), (4.6), (4.7). Deliberate violation of (4.10) might occur if the constant tax rate r_1 that is consistent with the initial obligation $0(1)$, were considered too low in the long run. In this case a higher terminal obligation than that established by (4.10) (and (4.11) and (4.12)) would be justified.

A brief commentary is in order on the problem of specifying the coefficients of the objective function. Relative values must be established for running the system at a deficit, paying various cohorts less than they earn and/or less than a socially adequate benefit, and for creating a terminal obligation that implies a higher future tax rate. Moreover, if higher future tax rates are acceptable, then windfall benefits are available and their distribution over various cohorts depends on the objective function coefficients assigned to the slack and artificial variables and the paramater H that constrains the terminal obligation $0(T)$. The difficulty of establishing these coefficients is considerable; but it should be emphasized that this intrinsic difficulty is merely spotlighted—not created—by the linear programing formulation. In the next section we shall offer further comment on the problems of parameter specification in the linear programing model.

The linear programing problem formulated here should involve no serious computational difficulties for values of T even greater than 100. Some of the elaborations we have suggested might involve many more variables and constraints—but even then the computational outlook is favorable. These more elaborate models, in common with the simple model, have a special network structure; this means that prospects would be excellent for finding or developing a special algorithm capable of practical computation of very large problems. A second potential benefit of this special structure is the possibility, which we have not yet explored, for further analysis and interpretation of the social security planning problem by means of duality theory of linear programing.

Hopefully we have indicated by these remarks that a range of formulations exist for this problem and that more analysis will be required before definitive knowledge is available to outline the limits and possibilities inherent in the social security mechanism.

V. Concluding Observations

Our purpose here is to relate our analysis to a more general view of the social security planning problem. This problem requires a practical synthesis of complex empirical data and predictions, a balancing of the interests of present and future generations, and compliance with underlying administrative and economic realities. While it is obvious that theoretical work by economists, sociologists, statisticians, etc., can be useful to the planner, the exact means of applying such expertise are less obvious. Basic reliance, of course, must always be placed on the synthetic ability of the informed, intelligent planner. But, well defined, systematic procedures that guarantee optimality, if appropriately used, can certainly benefit the planning process. Such procedures are increasingly beneficial if they explicitly formalize the channels through which empirical predictions, value judgments, and theoretical results—e.g., from economics—impinge on the final plan.

We contend that our linear programing model is just such a planning tool. It is directly useful as a rational, disciplined merchanism for detailed planning in terms of empirical data and requirements. It has immense indirect value because it provides an ideal junction through which general theory may be used to shape detailed and specific plans. The linkage between theories and plans is through the parameters of the linear programing model.

To expand on this point and relate it specifically to the analysis in this paper we shall sketch juxtaposed, stereotyped "before and after" views of the general planning process as altered by the use of linear programing. Informal planning methods, however competently and effectively employed, typically do not separate questions of fact, value, and logical implication. For the outsider, at least, it is frequently difficult to distinguish analysis and intuition, objective and subjective information, personal and general value judgments. This does not mean that informal planning is necessarily chaotic or irrational; we only contend that it is generally incomprehensible to outsiders and only partially understood by many insiders. Moreover, planning efforts on problems that involve considerable intrinsic complication are frequently accomplished by circumscribing the problem to a point where attention may be confined to a small manageable subset of the potentially relevant variables and relations.

Programing methods lead to several important changes as the result of a new division of labor. Analytical manipulations are relegated to a computer-executed algorithm. This greatly increases the planners' ability to deal with large and complex problems. Freed from the burden of analysis, the planners' judgment is focused on specification of the parameters for the programing model. Thus, one large, complex, and somewhat ill-defined problem is transformed into a list of individual, comparatively precise questions. Answering these questions, by providing specific values for the parameters of the programing model, supplies the essential information and judgments needed to specify a plan.

The simplification of the planning problem and the shift of attention to parameter specification should have two important effects. A more efficient allocation of the planners' effort in estimating the important unknowns in the problem should result. A more portentous result is that application of general theories (economic, statistical, sociological, etc.) to the problems of parameter specification is quite immediate, while the application of such theory in informal planning procedures is much less direct and obvious. Thus, by adopting programing methods, the planners achieve significant gains in potential access to an immense reservoir of useful knowledge.

The parameters of the linear program model in section IV require demographic and economic predictions, relative valuations on providing various cohorts smaller benefits than the interest-weighted value of their contributions, relative valuations on providing various cohorts a less than socially adequate retirement benefit, and relative valuations on increases in the future tax rate. Problems of this sort can be and have been dealt with by social scientists. It is particularly important to note that theory from the social sciences may not completely determine a parameter but will frequently limit the range of a param-

eter or will require that certain relations hold among the values of several parameters. Results of this form, while mysterious and unsatisfactory to the layman who wants simple answers, can have tremendous power in simplifying the problem of parameter specification.

We have provided in this paper a limited but hopefully instructive example of the use of general mathematical models of social and economic mechanisms to specify parameters in a planning model. It will be recalled that the model of section III, while quite simple and abstract, did, nevertheless, yield useful restrictions on the form of the equity constraint and on the value of α in the linear programing model. The continuous model was also useful in clarifying the issues involved in specifying a limit on the terminal obligation, $0(T)$, in the linear programing model. Thus we would stress the essential complementarity of the models developed in sections III and IV. The linear programing model provides a means of planning and an explicitly systematic means of applying general theories to the planning process. The continuous model is a means of deducing restrictions on the parameters and structure of the linear programing planning model.

At present, parameter specification would, in practice, have to be accomplished under the dominant influence of informed, intelligent, subjective judgment. With time, the accumulation of experience and reliable theory should narrow the range of subjective discretion and decrease the expected impact of subjective error. We would emphasize that the existence and use of a planning procedure that invites the application of theory is critical to the evolutionary development of a symbiosis of theory and practice.

General and abstract models, framed to elucidate essential characteristics of a social security system, or one of the systems that interact closely with the social security system, are thus seen to be doubly useful: they further general understanding and they can serve specific purposes in social security planning. The model of section III, while of some use in both respects, is neither comprehensive nor essentially novel. A fuller understanding of the social security problem requires relaxation of the assumptions we have made to isolate a simple, tractable, initial problem. Two more general problems are certainly germane. The first problem involves optimal schedules of tax rates and benefits. Here it should be noted that the deduction of necessary and/or sufficient characteristics of optimal schedules could be very useful in constraining a planning model. The second problem arises from considering feedbacks of the social security system on the work force, the working span and on output. It is plausible that definitive work on these problems, and others related to the use of the social security mechanism, would be stimulated by a social security planning operation that used mathematical programing methods.

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"EARLY RETIREMENT" TRENDS AND PENSION ELIGIBILITY UNDER SOCIAL SECURITY

BY JAMES H. SCHULZ*

The failure and/or inability of individuals in the past to prepare for an ever-growing number of retirement years through personal or group action has resulted in today's poverty stricken retired aged population. There has now been accumulated enough reliable statistical information to clearly demonstrate the existence of a relatively low economic status for all but a small minority of the current U.S. aged population. The situation is particularly bad for retired individuals and families which must rely upon savings and various forms of nonwork income to maintain their standard of living. Survey data for the United States indicate that these resources are quite small for much of the population currently retired.[1]

In recent years, however, significant changes regarding retirement security have taken place in the United States. Improved and broadened social security, mushrooming private pension plans, medicare, and extended economic prosperity should provide better retirement protection in the future. The question, therefore, arises: Will the changes which have occurred and are occurring in the U.S. institutional provisions for retirement security significantly improve the economic circumstances of future generations of older people?

This paper will report on findings which indicate that the future economic circumstances of retired persons relative to the rest of the population will not be significantly improved. It will then discuss the question of "early retirement" and the desirability of reducing the social security eligibility age.

1. SIMULATING THE RETIREMENT PROCESS

In order to investigate the future economic circumstances of the retired aged population, a simulation model has been constructed to incorporate and represent the essential features of the major private and public pension systems existing in the United States. In addition, the model has been designed to take into account relationships among important demographic and work force variables influencing the pension position and savings behavior of individuals in the economy.

Various methodological techniques have been used by researchers for simulating or representing reality.[2] The technique used in conjunction with the model cited above is stochastic simulation—stochastic in the

*Assistant professor of economics, University of New Hampshire; currently Fulbright lecturer in economics, University of Teheran, Iran.

[1] See, for example, Lenore A. Epstein and Janet H. Murray, "The Aged Population of the United States—The 1963 Survey of the Aged," Social Security Administration, Research Report No. 19 (Washington: Government Printing Office, 1967).

[2] For an elaboration of this point, see "Simulation: a Symposium," *American Economic Review*, vol. 50 (December 1960), pp. 893–932, especially the article by G. Orcutt and M. Shubik.

sense that the model allows for the element of chance in addition to asserting specified relationships among the variables. Given certain specified inputs, probabilities of occurrence for various events can be specified. Utilizing the services of a high-speed electronic computer, the model can then be used to investigate the problem under consideration (i.e., to project pension income and asset distributions for a future aged population).

The details of this model and previous research findings have been reported upon elsewhere.[3] Before proceeding further, however, they will be summarized:

1.1 *The life process model*

In order to project pension income and assets of the retired aged, it is necessary to construct a "life process" model which will permit those activities of individuals to be simulated which have an important influence on pensions and assets. These activities can be divided into the following four categories:

(*a*) Demographic.
(*b*) Work force and earnings.
(*c*) Pension status.
(*d*) Asset accumulation.

A large sample of persons in the U.S. population, who were, in general, between the ages of 45 and 60 in 1960, is aged 20 years, using the simulation process.[4] At the end of 20 years, these people are age 65 or over and represent the aged population in 1980. Naturally not everyone in 1960 between 45 and 60 can be expected to live at least 20 years. Hence the first life process activity considered in the simulation model is death. A probability of death for each particular year is specified for individuals based on their sex, race, and age. A random drawing from the associated probability distribution is used to determine whether an individual will die or live that year. Similarly, probabilities are specified for other possible occurrences built into the model—labor force exit and entry, job change, pension coverage, vesting, periods of unemployment, etc.[5]

Each possible "occurrence" specified in the model is treated in a manner similar to the live-die occurrence—each person being considered in turn. By sequential handling of the various occurrences it is possible to make the consideration of any one occurrence dependent on occurrences which had been handled before it. Once 1 year's simulation is completed, the individual, if he had survived, is aged another year and the process immediately repeated. This continues until the year 1980 is reached (i.e., completion of 20 "passes" in the computer). After all individuals have been processed, the resulting sample popu-

[3] James H. Schulz, "The Future Economic Circumstances of the Aged: A Simulation Projection, 1980," Yale Economic Essays, vol. 7 (spring 1967), pp. 145–212.

[4] The basic data used are from the "one-in-a-thousand sample," a set of tapes produced by the U.S. Bureau of Census which contains separate records (including demographic, work force, and income information) of a 0.1 percent sample of the U.S. population as recorded in the 1960 census. See "One-in-a-thousand Sample Description and Technical Documentation," U.S. Census of Population and Housing: 1960 (Washington, undated). The subsample used for the simulation consisted of 33,680 persons.

[5] For example, the probability that a nonwhite female of age 50 would die in year 1961 was specified as .011. A random number generator was used to generate a number between 1 and 1,000. If the number generated were greater than 11, the individual was considered to live through the year. Conversely, if the random number generated were 11 or less, the individual was considered to have died in that particular year.

lation represents the major part of the future aged population, since the surviving individuals are now 65 to 85 years of age.

During the simulation, work income, pension coverage, and asset histories are kept for each individual. Social security benefits for those persons retired and no longer in the work force (and eligible) can be calculated by applying the average "creditable" wage income generated by the simulation to a social security benefit formula. Where applicable, private pension benefits and government pensions can be estimated based on employee annual wage and/or years of service.

Having calculated private and public pension benefits, a "census" is taken of the retired population at the end of the simulation period, and various distribution of pension income and assets for couples and unrelated persons can be derived.

The simulation technique permits working at the micro-economic level. In addition, sensitivity testing of the model is used to represent a particular system (i.e., the simulation can be rerun many times with one or more parameters being altered each time). Such tests are useful in indicating whether any of the parameters (especially those which are crudely estimated because of data limitations) can seriously distort the results if in error. In addition, such tests help to identify which parameters are most important with regard to policy decisions relating to the area under investigation. Policy alternatives can, therefore, be evaluated using the simulation model to see how certain institutional or behavioral changes would affect the results.

"Possibly one of the most valuable contributions of simulation to date (is) the discipline imposed by the necessity of precisely defining for the computer both the problems and questions to be answered." [6] Simulation forces the investigator to work through the system being represented at a very low level of aggregation. The requirements for programing the model being used require that one attempt to identify all the significant influences, their direction, and their interrelationship.

1.2 *Prior research findings*

In an attempt to find out more about the economic situation of retired older people in the future, distributions of pension income arising out of social security, private, and government pension coverage and assets in retirement were projected. For the vast majority of retired persons social security payments together with private pension benefits are now, and promise to be in the future, the dominant source of retirement income.[7] By projecting these benefits, the projections sought to investigate the extent to which the income situation of the retired aged in the future might be improved.

The object of these projections was not so much to predict what the actual future economic circumstances of the retired aged would be in 1980; [8] rather it was an attempt to investigate the pensions and assets which one could expect to be available to the aged, given the existing institutional pension structure and certain assumptions with regard

[6] Martin Shubik, "Simulation of the Industry and the Firm," American Economic Review, vol. 50 (December 1966), p. 913.

[7] Epstein, op. cit., p. 36.

[8] Obviously future benefits depend in large part upon public and private pension decisions still to be made.

to changes in these institutional arrangements in the next decade and a half. No attempt was made to predict dramatic changes which might possibly take place in the future with regard to individual and/or group views concerning the provision of income in retirement. Instead, an attempt was made to better understand what income the existing pension structure would provide and whether changes in this structure might indeed seem necessary or desirable.

It was necessary to make many assumptions to make the projection. Many of these resulted from inadequate data. Still others were necessary because it was impossible to know with certainty what changes in the U.S. pension system would occur in the future. Because the results of the simulation were in part dependent on the assumptions made, the simulation was run a number of times under different sets of assumptions. It would have been impossible in terms of time and cost to run the simulation using all possible combinations of assumptions; instead, only a few of interest and importance were considered.

In general, where doubt existed as to the appropriate assumption, the decision was made in favor of being consistently liberal, producing a probable upward bias in the income and asset projections. This was done to avoid the criticism that the research findings resulted from restrictive assumptions, restrictive in the sense that they conflicted with some other person's idea of normalcy.

Despite this bias, the results were definitely not encouraging with regard to the future economic situation for retired aged. The study found that, while the existing pension system can be expected by 1980 to have produced a sizable shift upward in the distribution of pension income for aged persons, there would still be a large proportion of aged units in 1980 with "very low" pension incomes. In addition, using various different measures of income "adequacy," it was found that little or no improvement in the adequacy of aged income (from pensions and assets) can be expected relative to the rising incomes of the rest of the U.S. population.[9] Tables 1 through 5 present the projected distributions.

TABLE 1.—PROJECTED TOTAL PENSION INCOME DISTRIBUTION FOR RETIRED COUPLES AND UNMARRIED INDIVIDUALS, 1980[1]

[In percent]

Total pension income	Couples	Unmarried units
Less than $1,000[2]	5	32
$1,000 to $1,999	16	19
$2,000 to $2,999	28	31
$3,000 to $3,999	25	11
$4,000 to $4,999	14	5
$5,000 to $9,999	12	3
$10,000 and over	(3)	(3)
Total	[4] 100	100

[1] Pension income includes benefits from social security, private pensions (including State and local plans), and Federal retirement programs.
[2] Includes units without pensions.
[3] Less than 1 percent.
[4] Totals may not sum to 100 percent due to rounding.

[9] The standards used were the social security poverty index and the U.S. Bureau of Labor Statistics, "Budget for a Retired Couple."

TABLE 2.—PROJECTED INCOME FROM SOCIAL SECURITY AND PRIVATE PENSIONS FOR RETIRED COUPLES AND UNMARRIED INDIVIDUALS, 1980

[In percent]

Amount of income	Couple units [1]		Unmarried units [1]	
	Income from social security	Income from private pensions	Income from social security	Income from private pensions
Less than $1,000	4	35	17	49
$1,000 to $1,999	21	39	26	34
$2,000 to $2,999	43	17	51	11
$3,000 to $3,999	30	6	7	3
$4,000 to $4,999	2	2	0	1
$5,000 and over	0	(2)	0	(2)
Total	[3] 100	100	100	100

[1] Recipients only.
[2] Indicates less than 1 percent.
[3] Total may not sum to 100 percent due to rounding.

TABLE 3.—MONEY INCOME DISTRIBUTIONS OF RETIRED UNITS, 1962 AND 1980 PROJECTIONS

[Percent distribution]

Item	Less than $1,000	$1,000 to $1,999	$2,000 to $2,999	$3,000 to $3,999	$4,000 to $4,999	$5,000 to $9,999	$10,000 and over	Total
Couples:								
1962 [1]	7	32	31	13	7	7	2	100
1980: [2]								
(a) Pension income only	5	16	28	25	14	12	0	100
(b) Pension plus asset income [3]	4	11	20	26	19	20	1	100
Unmarried individuals:								
1962	51	35	9	2	1	1	------	100
1980:								
(a) Pension income only	32	19	31	11	5	3	0	100
(b) Pension plus asset income	4	13	24	26	17	16	1	100

[1] Based on data from U.S. Social Security Administration, 1963 Survey of the Aged.
[2] Simulation projection run 2 assumptions.
[3] Pension income plus 4½-percent return from financial assets. No estimation of public assistance, veterans' benefits, rents, and contributions by relatives are included.

TABLE 4.—INCOME DISTRIBUTION OF RETIRED COUPLES, 1962 AND 1980 PROJECTIONS

Couples	Under $1,000	$1,000 to $1,999	$2,000 to $2,999	$3,000 to $3,999	$4,000 and over	Total
1962 [1]	7	32	31	13	16	100
1980 money pension plus asset income [2]	4	11	20	26	40	100
Real pension plus asset income [3]	11	29	31	18	11	100

[1] Based on data from U.S. Social Security Administration, 1963 Survey of the Aged.
[2] Simulation projection run 2 assumptions.
[3] Assumes average price level rise in future will be at the same rate which occurred during the 1955–65 period (1.6 percent yearly).

TABLE 5.—AGGREGATE PERSONAL INCOME ESTIMATES FOR THE RETIRED AND NONRETIRED POPULATION, 1980

	1960	1980
1. Total personal income of retired aged persons (billions)	$26	I $70.5 II $50.1
2. Total personal income of nonretired persons (billions)	$416	I $828.0 II $848.0
3. Personal income per capita for retired aged persons	$2,144	I $3,593 II $2,554
4. Personal income per capita for nonretired persons over age 20	$4,104	I $6,412 II $6,570
5. Ratio of retired aged per capita personal income to nonretired (over age 20) per capita personal income	0.52	I 0.56 II 0.39
6. Retired aged personal income as a percent of total personal income	6	I 8.6 II 5.6
7. Retired aged population as a percent of the total U.S. population	6.5	8.3

The projected asset picture for older people was somewhat better. Given "strong" saving behavior, aged units in 1980 could be expected to have accumulated substantially greater total assets than aged units possessed in 1962. Given past experience, however, a large proportion of these assets would be in the form of less liquid home equity; projected aged financial assets in 1980, although distinctly improved over the 1962 situation, were much smaller than projected total assets.

The saving rate and assumptions upon which the estimates were based were, as in the case of social security benefit increases, considered liberal. The simulation model assumed that all units saved, subject only to the qualification that this saving was reduced as a result of unemployment experiences. In contrast, however, a large proportion of people currently reach retirement age with little or no personal financial assets. The "1963 Survey of the Aged" found, for example, that 22 percent of couples, and approximately 35 percent of unmarried individuals between the age of 62 and 64, were without financial assets, and that 9 percent and approximately 20 percent, respectively, had no assets of any kind.[10] Whether personal savings behavior for retirement will change significantly for a large segment of the population, therefore, still remains to be seen.[11]

2. The Question of Early Retirement

The research results summarized above indicate a possible need for additional action to improve the incomes of future aged persons. Such a conclusion assumes that the aged population desires (and that society in general concurs) to be able to maintain a standard of living for most aged units which is comparable in some way to the rest of society. Rejected is the idea that old age is a hibernation period where living slows down almost to a stop while people wait for death.

"Whether we should have a society in which a large fraction of the public scrimps in their productive years to provide themselves with a higher standard of life in old age than they ever enjoyed in the prime of life," [12] or whether we should have a society—as now—in which a large fraction of the public lives in retirement, at a significantly lower standard of living than they enjoyed while the head worked, is a legitimate question to be decided by people—individually and/or collectively. There are, of course, a whole range of intermediate alternatives.

The remainder of this paper focuses upon one economic aspect of the aged question receiving increased attention. It studies some of the possible implications of retirement at earlier ages. In addition, it raises objection to proposals advocating reduction of the eligibility age for social security retirement benefits.

3. The Early Retirement Trend

There is a rapidly accumulating body of data which indicates a significant rise in "early retirement" (i.e., before age 65) among male

[10] Epstein, op. cit., table 4.5.

[11] For additional problems associated with savings in the form of home equity, see James H. Schulz, "Some Economics of Home Ownership," Gerontologist, vol. 7 (March 1967), pp. 73–74, 80.

[12] Milton Friedman, "Capitalism and Freedom" (Chicago: University of Chicago Press, 1962), p. 189. Friedman attributes this position to proponents of a policy of governmental intervention in retirement planning.

workers in the United States. Data from the Current Population Survey, for example, show that nonparticipation in the labor force among men age 55 to 64 rose from 11.5 to 15.5 percent between 1956 and 1966.[13]

Much of this rise in nonparticipation occurred among men age 60 to 64 and has occurred during recent years. Table 6 shows the 1961–66 participation rates for males between the ages of 60 and 64. It can be seen that the participation rates have been falling rather sharply, especially after the minimum social security eligibility age of 62.

TABLE 6.—CIVILIAN LABOR FORCE PARTICIPATION RATES FOR MEN, ANNUAL AVERAGES, 1961–66

Age	1961	1962	1963	1964	1965	1966
60	85.5	85.9	88.1	85.5	86.0	85.9
61	85.6	81.9	83.5	84.6	83.3	83.4
62	82.0	80.5	79.7	78.2	78.7	79.4
63	79.9	76.9	75.5	74.1	72.5	71.1
64	74.9	74.2	71.5	71.5	67.7	67.4

Source: Unpublished data, U.S. Department of Labor, Bureau of Labor Statistics.

The reasons for this trend are not definitely known. A 1963 survey of salary and wage workers, age 62 to 64 (retiring since 1957), found, however, that only 9 percent reported retiring because they "preferred leisure." [14] Almost 75 percent reported retiring because of poor health (53 percent) or involuntary loss of job (22 percent). Whether poor health was the real reason for those who gave it as an explanation for retirement or just a rationalization by some unable to find work is not known. Using a rather stringent disability definition, the Bureau of Labor Statistics found only 30 percent of men age 60 to 64 who were not in the labor force in 1966 unable to work because of long-term mental or physical disabilities.[15] The appropriate percentage probably lies somewhere between the Social Security and Bureau of Labor Statistics findings.

F. Le Gros Clark has described part of the problem which may be arising as follows:

> In the remote past it had always been possible to let a man moderate his efforts or change his style of work as soon as the years began to tell. The advance of mechanization made this progressively less practicable. Industry has now reached a point at which the dilemma is becoming self-evident; manufacture and transport cannot economically absorb more than a small proportion of their human wastage; i.e., the "marginal" types of laborer embodied in many of their older employees. The result has been the creation of an extended "no man's land," lying between the close of a man's normal working life and the time when true old age at last supervenes.[16]

[13] Susan S. Holland, "Adult Men Not in the Labor Force." Monthly Labor Review, vol. 90 (March 1967), p. 7.

[14] Lenore A. Epstein and Janet H. Murray, "The Aged Population of the United States—The 1963 Social Security Survey of the Aged," Research Report No. 19 (Washington, Government Printing Office, 1967), table 8.4.

[15] Holland, op. cit., table 1. The BLS count of men "unable to work" excludes, however, men with temporary injuries or illnesses and men with some combination of minor disabilities.

[16] "Work, Age, and Leisure" (London, Joseph, 1966), p. 13.

Other possible reasons for early retirement include age discrimination and unemployment arising out of cyclical fluctuations or technological change. A recent Labor Department study on age discrimination in employment concluded that older workers who leave or lose their jobs are often unable to find other work because of discriminating hiring practices by employers. The study reported that "approximately half of all job openings which develop in the private economy each year are closed to applicants over 55 years of age, and a quarter of them are closed to applicants over 45." [17]

What happens to the older worker who loses his job because his plant closes or a machine replaces his skill? Faced with the very difficult, if not impossible, task of getting another full-time job, he is often forced, after unemployment benefits expire, to live off of savings, relatives, or relief. As soon as he reaches the age of social security early retirement eligibility (currently age 62 for males), he is likely to "retire."

The Social Security Administration reports that "during the past 4 years close to half the men and two-thirds of the women workers awarded retirement benefits under the social security program have been under the traditional age of 65." [18] Just how many of these early retirees were forced to retire because of poor work prospects is not exactly known.

There is clearly a vital need for additional information and research on the early retirement question; we need to know more about the pre- and post-retirement work history, assets, health, and total retirement income of persons retiring before age 65. Until we know more of this information, formulation of successful public policy in this area will be very difficult.

4. Reduction of the Social Security Eligibility Age

Evidence of older worker employment difficulties caused Senator Robert Byrd, of West Virginia, to propose an amendment to the 1965 social security-medicare bill (now law), to reduce the initial eligibility age for social security retirement benefits from the present age 62 to age 60. The benefits were to be actuarially reduced based on the number of years payment began before age 65. The Senate passed the proposal by voice vote without a dissenting word being spoken, but the amendment was later dropped in conference. Senator Byrd, however, has continued to press in recent years for passage of a similar amendment to the law.

In view of the inadequate information currently available on motivations for early retirement (discussed above), and in view of the possible social consequences (discussed below), it would seem that the Byrd proposal requires more careful study before enactment than it has received thus far by Congress.[19] If the Byrd amendment becomes law, this country may find itself taking a step backward in the war on poverty; the effect of the Byrd amendment might be to push millions of Americans into even deeper retirement poverty.

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[17] U.S. Department of Labor, "The Older American Worker—Age Discrimination in Employment." (Washington, Government Printing Office, June 1965), p. 6.

[18] Lenore A. Epstein, "Early Retirement and Work-Life Experience," Social Security Bulletin, vol. 29 (March 1966), p. 3.

[19] No formal committee hearings have ever been held, although it has been passed by the Senate a total of 3 times.

If, for example, a worker covered by social security has an earnings history which makes him eligible at age 65 for social security benefits of $100 per month,[20] Senator Byrd's amendment would pay him two-thirds that amount ($66.66) should he retire at age 60. This benefit would not increase to $100 per month when the retired worker reached age 65; instead, it would remain at the lower level for the rest of his life.

The premise upon which Senator Byrd based his desire for earlier social security eligibility is to some extent praiseworthy. In 1965 he argued:

> The basic object of reducing the retirement age to 60 is to free the worker at that age so that he may make an independent decision, based on his own situation, as to whether he can, with dignity, continue to work * * *. Best evidence shows that many men and women between the age of 60 and 65 are simply unable to work. Secondly, it is also quite clear that workers in this age group who are able to work experience extreme difficulty in finding suitable employment. And finally, it is becoming increasingly evident that our new productivity is shortening the length of our working life just as certainly as it has shortened the length of the working week.[21]

And in 1966 he argued:

> Despite the fact that many Americans are living longer, they are not necessarily working longer. Many have physical disabilities which prevent them from participating in our fast-moving industrial process. Many more, although willing and able to work, find themselves the victims of discriminatory employment practices and technological changes which favor the young. The net result is that many older men and women are forced into retirement years before they are able to qualify for retirement benefits.[22]

The solution to the problem of a rising number of unemployed older workers is not necessarily to force these workers into earlier and earlier retirement with smaller and smaller retirement pensions. This is Senator Byrd's solution. This is also the solution of the overwhelming bulk of private pension systems in the United States which also cut drastically pension benefits of early retiring workers.

There are at least three major costs associated with such a solution. First, by encouraging, and, in many cases, forcing workers to retire early with reduced private and public pension benefits, the resulting retirement income may be seriously inadequate. This is especially true, given the current and projected inadequacy of pension income (described in the first section of this paper), for large numbers of retired persons. In addition, early retirees are more likely to be workers with low educational attainment, low earnings, poor work histories and, hence, with low pension income.[23] Thus, for example, in 1966, under the

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[20] The approximate average benefits paid to men in 1966.
[21] Congressional Record (Washington: Government Printing Office, July 7, 1965), pp. 15792–15793.
[22] Congressional Record (Washington: Government Printing Office, Oct. 12, 1966), p. 25295.
[23] See "Educational Attainment of Workers in March 1965," Monthly Labor Review (March 1966), pp. 250–257.

most recent benefit level, the average social security award to an early retiree male was about $1,000 per year. For males not retiring early, the average benefit award was about $1,350.[24]

Second, there is the loss in real output arising out of the consequent reduction in the labor force. Evidence indicates that most workers prefer the monetary and psychological benefits of employment to retirement at present levels of private and public pensions. Those workers who desire and are able to work without adversely affecting the productivity of others can keep up total output and keep down the "burden" of supporting the nonworking portion of the population.[25]

Third, by institutionalizing age 60 as the initial eligibility age for social security, Congress may, in effect, be setting a guideline which would tend to push the average age of retirement in the United States lower. This phenomenon was clearly evident following the establishment of social security and the eligibility age at 65 in the thirties. And the recent establishment of eligibility at age 62 may in part be responsible for the problem about which we are now concerned. Reducing the eligibility age encourages employers, for example, under pressure from younger workers to force more workers into retirement and to be more reluctant or unwilling to hire and, where necessary, to train older workers.

5. Simulation Analysis of Retirement Trends

In order to show the possible effects on retirement income of lowering the social security eligibility age, pension income distributions for 1980 are projected using the simulation model described in section I. Three projections are made, each based upon different assumptions regarding the trend of retirement rates for males. Tabulations are also presented of projected pension income by age of retirement.

5.1 *Early retirement simulations*

Projection I was a hypothetical construct. It assumes no change over time in the age 45 and above male retirement rates, maintaining retirement rates at the level existing in 1960.[26] It also maintains the 1960 situation regarding male eligibility for social security (i.e., benefits available only at age 65 or over with no early retirement at reduced benefits possible).

The attempt is to simulate a situation which would approximate what might have happened if the social security system had not changed. Of course, this presumes that the necessary economic measures (i.e., appropriate monetary, fiscal, and labor force policies) would be taken so as to provide jobs for workers in satisfactory employment.[27] The resulting retirement before age 65 would, therefore, be due to personal preference for leisure over work of problems of health, and

[24] Social Security Bulletin, vol. 30 (June 1967), table Q–6.

[25] This burden includes, in addition to pensions and other income maintenance programs, the costs of social services required to reduce and to deal with the psychological shock of retirement affecting many workers.

[26] Stuart H. Garfinkle, "Tables of Working Life: Length of Working Life for Men," U.S. Bureau of Labor Statistics Bulletin 1001 (Washington: U.S. Government Printing Office, 1950); Stuart H. Garfinkle, "The Length of Working Life for Males, 1900–60," Manpower Report No. 8 (Washington: Government Printing Office, 1964), table A.

[27] By satisfactory employment is meant employment in jobs at earnings levels close to the workers' peak earnings.

would not be due to involuntary retirement arising out of unfavorable employment opportunities.

Projection II results from introducing a moderate upward trend in the male retirement rates between 1960 and 1980. This trend is based on projections of participation rates for older males by the Bureau of Labor Statistics.[28] Social security retirement benefit eligibility at age 62 is assumed available for men after 1962.

Projection III assumes a larger decline in the average age of retirement. The retirement rates for this projection are estimated from projected participation rates, using a technique developed by Stuart H. Garfinkle.[29] The trend in participation rates is based upon the data presented in table 6, which shows recent estimates of male participation rates over the 1961–66 period. Social security eligibility at age 60 is assumed.

Table 7 shows the resulting pension income projections. The effect of early retirement and early pension eligibility (under the assumption assumed) is to cause the income distribution to shift down at the lower end. This results in a sharp rise in the number of persons projected as receiving very low pension income—income which is, by present adequacy standards, inadequate.[30]

TABLE 7.—PROJECTED PENSION INCOME DISTRIBUTIONS, 1980

[Percent distribution]

Pension income	Retired couples			Retired unmarried		
	I	II	III	I	II	III
Less than $1,000	4	5	6	32	32	34
$1,000 to $1,999	17	16	25	20	19	26
$2,000 to $2,999	28	28	26	21	31	25
$3,000 to $3,999	24	25	21	20	11	10
$4,000 to $4,999	12	14	12	5	5	4
$5,000 to $9,999	16	12	11	2	3	2
Total	100	100	100	100	100	100

Source: Simulation model (see text).

5.2 *Projected pension-earnings ratios*

In a study of future aged pension income adequacy, which I have not yet fully completed, the effects of early retirement upon income adequacy are illustrated quite vividly. The measure of income adequacy being used in the study is the amount of wage replacement after retirement provided by pension income.

Table 8 shows some of the preliminary findings of this study.[31] It presents the projected ratio at retirement of total pension income to average earnings 5 years prior to retirement for married males (who were age 45 to 60 in 1960). The tabulation is broken into three groups by age at time of retirement: less than age 60, 60 to 64, and over 64.

[28] U.S. Bureau of Labor Statistics, "Labor Force Projections for 1970–80," Monthly Labor Review, 88 (February 1965), 129–140.

[29] Op. cit.

[30] The social security poverty index, for example, is presently about $2,500 for couples and $1,750 for unmarried persons.

[31] The simulation model described above (in modified form) was used to make these projections.

TABLE 8.—PROJECTED [1] RATIO OF TOTAL PENSION INCOME [2] TO PRERETIREMENT EARNINGS [3] FOR RETIRED NONAGRICULTURAL MALES [4]

[Percent distribution]

Ratio	Age at retirement		
	Less than 60	60–64	65 or over
Less than 0.10	16	6	3
0.10 to 0.19	50	19	10
0.20 to 0.29	23	27	16
0.30 to 0.39	5	21	26
0.40 to 0.49	3	11	15
0.50 to 0.59	1	5	12
0.60 to 0.69	1	4	7
0.70 to 0.79	0	3	5
0.80 to 0.89	0	1	2
1.0 or more	1	1	4
Total	[5] 100	100	100

[1] Source: Simulation model (see text).
[2] Social security, private pension, and/or Government employee pension.
[3] Average of 5 years prior to retirement.
[4] Married males only.
[5] May not sum to 100 percent due to rounding.

The replacement ratios for men retiring before age 60 were much worse than those for men retiring at the "normal" age of 65 or more. For example, only about 3 percent of those retiring before age 60 are projected to have a replacement of 50 percent or more of their average annual earnings from pension income. In contrast, a little less than one-third of those retiring at age 65 or after are projected to have a replacement above 50 percent.

6. Retirement Policy

The preceding sections have raised a number of questions regarding the advisability of lowering the eligibility age for social security at this time. Above all, there is a clear need for additional information regarding the reasons for the apparent rising numbers of males retiring before age 65.[32] In addition, it would be helpful to have detailed studies available on the experience other countries have had with early retirement provisions different from those of the U.S. social security system and with special unemployment provisions for older workers.[33]

Social security eligibility (with actuarial reduction) at age 60 or some other age could give greater retirement flexibility to older workers. But this expansion of the worker's freedom of choice regarding retirement planning necessities an economic environment which allows him to work if he is willing and able. If he is unable to work, because of age discrimination or because he lacks an appropriate skill or just because of the lack of jobs in a depressed labor market, retirement flexibility becomes meaningless. Early social security eligibility then becomes a sop or substitute for public assistance. At the same time

[32] A study by the Social Security Administration of early retiring persons in its "Continuous Work History Sample," who became eligible or "entitled" to retirement in 1964 is almost completed and promises to offer additional insight into the question.
[33] For example, Austria and West Germany both have "special" early retirement provisions.

it forces the worker into a situation of having to elect lower pension income in retirement for the rest of his life.

What is needed is improvement in public and private disability coverage and provisions, institution of extended unemployment compensation benefits for older workers similar to those in the Javits-Hartke amendment,[34] and job retraining and age discrimination legislation.[35] These measures, together with a vigorous labor market sustained by appropriate monetary-fiscal policy, would create the environment necessary to expand retirement flexibility.

If the Nation cannot, or will not, provide jobs for those older persons wanting to work, then it should face up to the responsibilities of insuring that private and public pension programs provide enough income for people to live decently, regardless of whether they retire early or late.

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[34] The amendment was passed by the Senate in 1965, but did not pass the House.

[35] There is some question as to just how useful such legislation can be. Older persons may be difficult to train because of poor education, unreceptiveness, etc. Discrimination because of age is not likely to be any easier to eliminate than race discrimination.

TAX MEASURES PROVIDING INCOME ASSISTANCE TO OLDER PERSONS

BY HUGH MACAULEY*

1.0 *Tax relief and income maintenance*

Whether the aim be income maintenance or income assurance, the income of older persons, or of any persons, may be raised by a variety of measures. We may help such persons in their search for employment and higher earnings so they may enjoy the prescribed income. They may be given assistance by private or public charity on the basis of their need, or they may qualify for transfer payments on grounds other than need. They may be given tax treatment that is more favorable than that given to persons similarly situated in all relevant respects except age. A variety of approaches abounds, but the use of taxes is a recognized and commonly accepted means for achieving the stated end. The customary emphasis on "aftertax income" brings home the point that if a person's income cannot be changed, it might be possible to change his taxes and still attain the goal of a higher residual income.

1.1 *Advantages of tax preference*

Not only is tax preference an available option; it is popular with both givers and receivers and is often chosen. The former may prefer tax relief over increased payments because new or heavier taxes are avoided, the benefits do not appear as Government expenditures which are subject to annual review and frequent criticism, and the arrangement does not require a new or expanded agency or bureaucracy to administer the benefits. Those receiving tax benefits are pleased with their enhanced aftertax position and seldom view their situation as anything other than justly deserved. They also appreciate the fact that they are less likely to be asked to submit and justify annual reports, file reports, or account for expenditures. While Congress may often be chided for its expenditures on this group or that group, less often does there seem to be a complaint of unfairness in tax favor given. The usual approach is to recognize existing tax favor, assume it is justified, and plead for its extension to other equally deserving groups.

1.2 *Disadvantage of tax preference*

The arguments against tax preference are equally imposing, but they appeal to different persons. The Treasury Department and those concerned with the efficient operation of the revenue system stress the difficulty in finding a tax that can be altered to benefit the precise group one chooses to help. If the need is to help the aged, a reduction in the income taxes of older persons is of benefit only to those who

*Professor, Clemson University.

have both age and income. Persons who are older but poorer may not benefit from this measure.

To illustrate the point, the Treasury estimates that in 1966 tax preferences to the aged costing $2.3 billion annually were going to 11 million of an estimated 18 million aged persons. Only one-fourth of these benefits went to persons whose incomes (including social security and railroad retirement benefits) were $3,000 or less. An additional one-fourth went to persons with incomes between $3,000 and $5,000. The remaining one-half went to persons with incomes over $5,000. No benefit went to the approximately 40 percent of the aged whose incomes were the lowest (13, p. 5). It is doubtful that this was the distribution of benefits envisioned when the measures were enacted.

Secondly, we have often seen how tax preference granted to one group generated political pressure to extend the benefits to similar or closely related groups. The exemption from tax given to railroad retirement benefits was probably significant in its effect on the tax treatment later accorded social security benefits which, in turn, served as justification for the favorable tax treatment accorded other income under the retirement income credit. Within limits the extension may not be a serious problem, but it can lead to the destruction of the tax system. The larger the benefits from tax preference, the higher must be the tax rates required to raise a given amount of revenue. The higher are these rates, the greater is the pressure to gain exemption from tax.

Thirdly, a system of taxation, already complex from special provisions, becomes increasingly difficult or impossible to comprehend as new exemptions are added. While those qualifying for the special treatment may profit, those who serve as tax consultants or in other ways advise or assist taxpayers are also beneficiaries. Complex special provisions, as for example those dealing with the sale of a residence by a person over age 65, increase the likelihood that intended beneficiaries will not understand the favorable provisions and so fail to benefit from them. This is reported to be particularly true with regard to the present retirement income credit (8, p. 197).

1.3 *Definitions of tax favor*

It may be readily agreed that tax preference is a source of aid, but agreement may not be so readily forthcoming as to what constitutes tax preference. Relief from a given tax may be viewed as a justified exemption from the power to destroy. The exemption from income taxation of interest on State and local bonds and the exemption of church property from taxation might be cited as examples.

Whether tax preference is involved might also depend on the definition of the tax base. An income tax should apply to income, but are contributions made by an employer to a pension plan to be considered as income to the employee? Since Congress defines the tax base, it may include or exclude items as it sees fit, although there is bound to be disagreement among constituents as to the propriety of the definition chosen or implied. A third area of disagreement might appear when it is agreed that the item is legitimately taxable, properly a part of the tax base, but should be excluded because some similar or closely related item is exempt. Examples abound: The retirement

income credit, depletion allowances for coal, exemption of old-age insurance benefits from income taxation, the taxation of small business corporations as partnerships and vice versa, and others.

Before it is argued that a given group of persons or form of payment is given tax favor, it would be well to state the assumptions that underlie the position. With this warning in mind, we will examine some of the forms of payment that are often listed as sources of tax preference for the aged.

2. Old-Age Insurance

While the old-age, survivors, disability, and hospital insurance program, as part of a broader social security program, is itself financed with a tax, the emphasis here will be on the income tax treatment of the payments and benefits made under the old-age insurance (OAI) part of the program. The aims, accomplishments, and operation of the program as it now exists is a proper topic for another paper.

Contributions to the program are made by employees at a prescribed rate and are matched by employers. Self-employed persons contribute at 1½ times the rate contributed by employees. The contribution of the employee and the self-employed person are considered part of adjusted gross income and so may become subject to the income tax. Contributions by the employer on behalf of his employees are not taxed to either of the parties. Benefits when received are not included in adjusted gross income and so are not subject to the income tax.

With these benefits to the aged exempt from income tax, the after-tax incomes of those who receive them are higher than they otherwise would be and so some contribution is made to the aims of income maintenance or income assurance. But these gains go only to those whose other incomes are high enough to make them subject to the income tax or whose other incomes are high enough that with these benefits they would become taxable. Those whose incomes are below these levels do not benefit from this provision. Further, the higher the person's taxable income, the greater the value of the provision to him. Benefits are, therefore, distributed in direct proportion to the tax bracket of the recipient.

It may be felt by some that while the income tax exemption of OAI benefits helps only the aged who are relatively better off, at least the exemption does not hurt those in the lower brackets. If, however, the loss in general revenue from this source must be replaced, income taxes and/or other taxes must be increased. Musgrave's study of the incidence of taxes and the more recent study by the Tax Foundation indicate that while Federal taxes are on balance progressive, the overall structure is much less progressive than the tax rates imply, and some taxes, like excises and customs are actually regressive (4, pp. 97–98; 7, p. 20). Thus, for every $3 that a family making over $15,000 has to pay in taxes to make up for the loss in revenue, a family making less than $2,000 must pay $1. Those in the lowest income brackets receive no benefit from the tax exemption of OAI benefits, but they will help make up the tax loss.

The amount of revenue lost by the nontaxability of retirement insurance benefits was estimated by Muntz, in 1957, to be between $400 and $500 million (3, pp. 355–356). At that time these benefits were 5.7 bil-

lion annually, but by 1965 they had more than doubled to 12.5 billion annually (5, p. 14; 6, p. 6). The Internal Revenue Service in its "Statistics of Income" has analyzed the returns of taxpayers over 65, but OAI benefits are not reported by taxpayers and so it is uncertain which taxpayers are benefiting from this tax exemption or how large the revenue loss is. However, two-thirds of the 3 million taxable returns reported no wage income, and so there was no barrier from this source to receiving benefits. In fact, almost 50 percent of each group of returns showing over $15,000 adjusted gross income showed no wage or salary income (11, p. 89). These persons who reported no wages could have received their full OAI benefits and enjoyed significant tax savings.

The exemption of these benefits from tax does not conform to the accepted standards of either vertical or horizontal equity, and several writers have proposed that the benefits be included in taxable income. There is a departure from the standards of vertical equity as expressed by the tax rates because OAI benefits received by wealthy persons will be subject to the same zero tax rate as those received by low-income beneficiaries. The concept of horizontal equity is violated by having two persons whose incomes are equal, one receiving OAI benefits and the other receiving an equal amount of wage income, but subject to different tax rates.

These benefits are tax preferred in the sense that the general definition of income as given in the Internal Revenue Code specifically includes retirement benefits. "Except as otherwise provided in this subtitle, gross income means all income from whatever source derived, including (but not limited to) the following items: "* * * (9) Annuities; (10) Income from life insurance and endowment contracts; (11) Pensions: * * * (9, sec. 61)." Accordingly, retirement benefits are normally included in adjusted gross income to the extent that they exceed the amount contributed by and previously taxed to the recipient, but OAI benefits are tax exempt in their entirety.

The proper tax treatment of amounts paid as workers' contributions is not so widely agreed on as the tax treatment of benefits. Some argue for the exemption of contributions from taxable income because, as they propose, benefits will be taxed later (3). Others point out that with a retirement income credit still operative, benefits, though includible in adjusted gross income, could still escape taxation, and so contributions should be taxed to compensate for this exemption (1). In view of the variety of forms of income covered by the retirement income credit and not previously taxed, this latter policy would seem to single out OAI for prepayment of taxes in anticipation of future possible exemption.

A stronger case can be built if one combines the generally accepted definition of income supported by most economists, that income is the algebraic sum of changes in net worth plus consumption, with the treatment of insurance as proposed by Vickrey (14, pp. 58–85). His point is that insurance against a future loss of income is analogous to a business expense and should be deductible under a personal income tax. Thus, the contribution made under OAI could be viewed as a legitimate expense of guaranteeing future income under given contingencies and should not be a part of adjusted gross income. The later payments of benefits would then be taxable. For the individual the

system would involve a deferral of tax from the time when the contribution was made until when the benefits were received. But, since the OAI program is operated on the basis that contributions should approximately equal benefits in each year, there would be no deferral of adjusted gross income for the Treasury.

An income insurance system such as OAI basically makes transfer payments from those who are working to those who are retired. Any given individual who works and contributes to the system may never receive retirement benefits should he die before retirement age. A tax on his contributions would be a levy on something that leads neither to his consumption of goods or services nor to a change in his net worth. He does enjoy a peace of mind knowing that if he lives to retirement, income will be forthcoming; but, this benefit, to a small degree, is a result of the service by the insurance agency and, to a large degree, stems from the transfer of payments from one group to another. The average recipient of benefits today gets back, tax free, far more than the contributions on which he paid tax, but increasingly many covered workers will pay income tax contributions which they will never see matched in equal payouts.

If a worker had received, through 1966, the maximum wage subject to OASDI tax since taxes were first collected in 1937, he would have paid in social security taxes $2,384.20, all of which would have been includable in his adjusted gross income and could have been subject to income tax. His expected benefits, if he and his wife had retired at age 65 in 1967, would be over $30,000. If he and his wife enjoyed normal life expectancy, he would have paid income tax on only 8 cents of every dollar he received. The Treasury estimates that for persons retiring in 1966, as much as 89 percent of their OASI benefits would have been includable in adjusted gross income if these benefits were treated like other retirement benefits (13, p. 14).

The proposed tax treatment would result in a much larger tax base because all benefits would be included in adjusted gross income while only contributions by employees and self-employed persons are now included. However, because those who receive benefits are likely to have lower incomes at the time of receipt, the tax rates and total taxes collected could be lower. In 1957, Muntz estimated that the taxation of benefits and the tax exemption of contributions would produce a net revenue decline of about $300 to $400 million (3, pp. 357–358). Table I compares contributions with benefits for 1965.

TABLE I.—OASI CONTRIBUTIONS AND BENEFITS, 1965

[In millions of dollars]

	Contributions	Benefits
Employee contributions	7,440	
Employer contributions	7,618	
Self-employed persons contributions	959	
Old-age retirement benefits		12,542
Survivorship benefits		3,979
Lump sum payments		217
Total	16,017	16,738

Source: Social Security Bulletin, Annual Statistical Supplement, 1965, pp. 6, 9.

The Treasury Department has recommended the inclusion of OAI benefits in adjusted gross income and the adoption of a new, higher old-age exemption that would in effect leave nontaxable 90 percent of the aged persons receiving social security benefits. The other 10 percent of the beneficiaries would be taxable; but to allow for the return of previously taxed contributions, never would more than two-thirds of their benefits be subject to tax. There is no mention of a tax exemption for contributions (8, pp. 199–201).

The Treasury's proposal has the advantage of treating OAI benefits like all other forms of income, but in effect this is achieved by extending a new and larger exemption to all forms of income for 92 percent of the persons over 65. The problem of nontaxibility of OAI benefits is settled; the problem of the exemption remains and will be discussed later.

By contrast, the proposal advanced in this paper and outlined above would result in higher taxes on the aged, but only on those who are taxable or near taxable. Additional taxes that would result would be collected from aged individuals in increasing proportion to their total income; additional benefits from these taxes could be distributed to the less affluent in inverse proportion to their other income or in any other pattern that seemed just.

If at the same time employee contributions were exempt from tax, there might be a net revenue loss and a net loss to the aged as a group. Offsetting this would be a greater equity of treatment. Persons young and old with equal incomes would pay equal taxes; or if it were felt that older taxpayers deserved special consideration, this could be given by an exemption applied to all forms of income or by special deductions applicable only to those taxpayers incurring the added expenses. Equity between generations would also be improved for no longer would a tax be levied on those persons who for years made OAI contributions, but because of an early death never enjoyed increased consumption or net worth from benefits; and only those persons who received benefits from their contributions would now be taxed on this gain.

3. Private Pension Plans

Under most private pension plans employers, and sometimes employees, contribute to a fund to provide pensions to workers when they retire. These plans, too, have enjoyed phenomenal growth.

TABLE II.—PRIVATE PENSION AND DEFERRED PROFIT-SHARING PLANS

	1950	1960	1965
Annual contributions by employers (million)	$1,750.0	$4,690	$6,660.0
Annual contributions by employees (million)	$330.0	$790	$1,090.0
Number of workers covered (thousand)	9,800.0	21,200	25,400.0
Number of workers receiving benefits (thousand)	450.0	1,780	2,750.0
Benefits paid (million)	$370.0	$1,750	$3,180.0
Reserves (billion)	$12.1	$52	$85.4

Source: Social Security Bulletin, April 1967, p. 20.

The tax treatment of payments into the funds largely parallels that of OAI, but the treatment of benefits differs. Employee contributions are included in the employee's taxable income; employer contributions are generally excluded; earnings of the pension funds are generally

not taxable. Benefit payments are considered in part a return of previously taxed contributions, which are not taxed, and in part a payment from contributions of the employer and the earnings of the pension fund, which are taxable.

Assistant Secretary of the Treasury Stanley Surrey holds that this tax treatment results in a loss of Federal revenue of between $1.4 and $3.8 billion, depending on how one reckons the taxable nature of the payments, but estimated roundly at $3 billion. He holds that the payments by employers do not meet the general requirements for deductibility; there must be a fixed liability on the employer to make a fixed payment to a definite person. The mere possibility that the employer may in the future have to provide his workers with a pension and that he is recognizing that obligation with a payment into a pension fund is not sufficient under the general principles of tax law to permit a deduction by the employer. Further, he notes, if the contribution is vested for the employee, general tax principles would hold that he has received taxable income (12, pp. 412–417).

The sums cited by Surrey are significant and would appear to contribute to income maintenance for the aged. But, since benefits are taxable to the extent not previously taxed, the tax savings must accrue from some source other than the partial exemption of benefits. It is the exemption from present tax accorded to contributions by employers and the exemption of earnings of pension funds that are considered tax favor. Yet two arguments may be offered to support the present treatment: one on the basis of definition of income and one on the basis of comparison with the treatment of similar payments.

Payments by employers into a pension fund are customarily required by an agreement between employer and employees. These payments cannot be recaptured by the employer until all obligations of the fund are met. The payments would appear then to be legitimate costs of doing business, paid to the fund and properly deductible to the employer, although Surrey holds that these conditions are not sufficient.

Payments by employers into the OASDHI fund are similar in all relevant respects except that they are required by law while pension plan contributions arise from employer-employee negotiations. If it is feared that employers will abuse this relationship by contributing and deducting more than is necessary to fund the obligations and later recovering these funds, penalties equal to the value of the tax postponement could be levied. If abuses can be handled as they develop, similar tax treatment of the employer contributions to the two funds would seem appropriate. Nowhere does anyone seem to have questioned the deductibility of the employer contribution to OASDHI.

Surrey holds out the possibility that employer contributions could be held deductible for the employer but considered as income to the employee, but, that this treatment would apply only where the employee receives a vested interest in the fund. Where the employee has no vested interest, he cannot be held to have received anything of value for his consumption or increased net worth and so he should not be taxed.

This treatment seems to misconstrue the meaning of the term "vested." Vesting does not customarily mean that the employee is assured of a payment from the fund. It does mean that even though he leaves his present employer, he will be eligible for a retirement

pension, but, only if he lives to the prescribed retirement age. Should he die before that time, he will receive little or nothing. The vesting provision is, in effect, no different from the conditions of the OAI program. Yet, apparently, no one has argued that the employer's contribution under that program be considered taxable income to the employee.

Contributions by employees to pension funds are taxed to the employee and this may be considered proper, although it seems to differ from the treatment proposed in this paper for employee contributions under OAI. However, employee contributions under pension plans customarily belong irrevocably to the employee and will be returned to him even if he should die before retirement. They are, in effect, a form of savings. This arrangement differs significantly from that existing under OAI. It should also be noted that unlike OAI where financing is shared equally by employers and employees, financing of private pension plans by employee contributions is the exception rather than the rule.

Only the tax treatment of pension funds remains. The preference here would depend on one's philosophy of business taxation. Earnings of proprietorships are imputed to owners and taxed. A part of corporate profits is usually neither paid to stockholders nor imputed to them, and so the corporate income tax is levied as an indirect way of reaching the increased net worth of the stockholder. In the case of pension funds, the beneficiaries of increased net worth will be those contributors who live to retirement; but, they have no present tangible claim, and, hence, no increase in net worth. Nor will they have a claim until they retire, and even then the amount will depend on how long they live. Viewing the situation from another standpoint, we already grant to life insurance companies, savings and loan associations, and the OSDI fund, a low rate of tax, or no tax at all, on earnings. Thus, the definition of income and the treatment of similar savings institutions both argue for low rates or a zero rate of tax on the earnings of pension funds.

The document prepared by the subcommittee notes that the existing tax treatment of pension plans is often supported by comparing it with the tax favor given by the deferral of tax on unrealized asset appreciation. The present writer reaches the same conclusion that the existing tax treatment of pension plans is justified, but on entirely different grounds. The comparison cited is, in fact, a weak foundation on which to base the taxation of pension plans. In the first place, many economists would argue that increases in asset value provide a basis for taxation, whether or not they are realized. But, second and more important, increases in asset values are forms of saving, while pension plans do not provide saving, but, insurance. The difference between the two is significant.

In sum, the argument that pension plans and similar deferred compensation arrangements receive tax preference and provide the aged with a tax-forgiveness or tax-deferral subsidy is not valid. Given the concept of income that underlies our income tax, and given the tax treatment of OAI benefits, railroad retirement benefits, and most other retirement plans, pension plans are not receiving more favorable or preferential treatment. There would seem to be no tax subsidy to this form of old-age income.

4. Double Exemption

Taxpayers over age 65 are allowed a double exemption when computing their taxes. Since a double exemption is given to only a few other taxpayers; i.e., those who are blind and those students who have adjusted gross income but are also dependents, it may be argued that this provision constitutes tax preference for the aged.

While taxpayers over age 65 find their after-tax income increased because of this provision, this gain is subject to the general criticism previously cited: The benefit goes to those persons over 65 who have income high enough to be taxable, and the value of the benefit and the revenue lost to the Government vary directly with the taxpayer's marginal tax bracket—the greatest tax saving going to those whose incomes are the highest.

In 1960 there were 6,668,000 additional $600 exemptions taken because of age (10, pp. 11, 95). This amounts to over $4 billion of income that may have escaped tax. How much revenue is lost by the extra exemption depends on the marginal tax rates of those taking the exemption; in 1959 Wilbur J. Cohen estimated the cost at $600 million (2, p. 542). The figure is doubtless higher now because of the increase in the number of persons over age 65 and the rise in annual average incomes.

The extra exemption was added in 1948 because, according to the Senate report on the revenue bill, the rise in prices that occurred during the war and in the postwar period and the increase in taxes during the war imposed a burden on older persons which they could not offset by accepting full-time jobs at prevailing high wages. Since high prices and high taxes apply to all persons without regard to age, higher exemptions might well have been granted to all persons. If the concern were over the fixed income aspect of the problem, favorable treatment could be given to all who held such securities as bonds, savings accounts, life insurance, and fixed pensions and annuities, and not to those who owned homes, real estate, or common stocks. But, this opens a Pandora's box of requests for tax treatment reflecting the effects of price level changes on all assets.

A natural sympathy extends to those who are old and it may be that society believes they deserve to receive more income before they are required to pay tax. This means, however, that younger persons with the same income will pay a higher tax, even though their problems may be equally or more serious, but different, revolving around educating their children, buying a home, financing a business, or providing for their old age. One economist has noted that it is entirely possible that the young can outearn the old.

The President has proposed that the additional exemption for persons over age 65 be discontinued and that in its place be substituted a special exemption that is much higher, being approximately equal to the present extra exemption, the additional standard deduction related to the exemption, and the maximum primary social security benefit, which is now exempt from tax (8, pp. 198–207). This proposal will exempt a man and his wife, both age 65, from any income tax until their income exceeds $5,777. A younger worker with a wife and the same income from wages and using a standard deduction would pay $810 in income tax and $254 in social security tax. Even if the

younger family included two children, the taxes would be $301 and $254, respectively. Obviously this preferred treatment of the elderly is of considerable aid to them. In fact, under the President's proposal preferential treatment may continue until the income of the elderly couple reaches $15,200. There would seem to be some question as to the desirability of extending tax preferences to persons at this level of income just because they are 65 or older.

The proposed new exemption is intended to benefit only low- and middle-income taxpayers and is designed to disappear as incomes rise. A simpler and more understandable way to achieve the same result would be to increase the progressivity of the tax rates. If it is honestly felt that a certain minimum sum is needed to support the taxpayer over 65 and that all income over that amount should be taxed, the deduction should apply to all taxpayers over 65 and not just to those with relatively low or modest incomes.

The disappearing exemption also creates a tax rate anomoly in that over the income range where it disappears, the tax rate is suddenly doubled. Not only is the extra dollar of income taxed, but, since a dollar of deduction is lost, a second dollar appears in the tax base.

To summarize, both the existing and proposed extra exemptions must be supported with arguments as to why the needs of the elderly exceed those of the young. If there are such needs, they might better be handled as special deductions, as is done with the medical expense deduction. The benefits, estimated at $600 million in 1959, go to only those older persons whose incomes are high enough to make them taxable, and the tax saving is again greater for those in higher income brackets. In 1964 over 600,000 tax returns of persons over 65 showed adjusted gross income over $10,000 and for this group tax benefits were the largest (11, p. 89).

5. Retirement Income Credit

The retirement income credit is one of those provisions that arose because of the most-favored-taxpayer philosophy. Social security and railroad retirement benefits were exempt from tax, but other forms of retirement income were not. Hence, the Internal Revenue Code was changed, in 1954, to allow the taxpayer a credit at the minimum tax rate on other forms of retirement income up to an amount roughly comparable to the maximum primary social security benefit.

Here is a provision whose cost and distribution can be readily determined.

TABLE III.—RETIREMENT INCOME CREDIT, 1964

Adjusted gross income	Number of returns	Amount of credit (thousand)	Average per return
Under $1,000 to $5,000	714,187	$67,119	$93.98
$5,000 to $10,000	358,317	56,364	157.30
$10,000 to $50,000	209,911	33,693	160.51
$50,000 to $1,000,000 plus	17,687	2,897	163.79
Total	1,300,102	160,073	----------

Source: Statistics of Income, Individual, 1964, p. 90.

Given the exemption of certain forms of retirement income, the retirement income credit may be justified to some extent on grounds of horizontal equity. However, the provision applies only to investment income, is reduced if the taxpayer has wage income, and is completely eliminated if his wage income is as much as $3,000. Thus, it is not all income of the aged that benefits from this provision but only certain forms. Further, wage income suffers relative to retirement income not only by being taxable but also by reducing the tax credit. In effect, a tax rate from one and a half to two times as high as normal is imposed on this limited amount of wage income between $1,200 and $3,000 for single persons over 65.

If social security benefits are made taxable, as has been proposed above, the justification for the retirement income credit disappears. If social security benefits continue nontaxable, support on grounds of equity for a retirement income credit will depend on whether one thinks this form of income should be treated like tax-exempt social security benefits or like taxable wages. In a period of relatively full employment, there would seem to be little reason for taxing labor income more heavily than nonlabor income; and even in a period of unemployment a better policy might be to increase effective demand rather than to encourage people to leave the labor force.

The President's proposals also include an elimination of the retirement income credit, on the grounds that it is a complicated provision and that it discriminates against wage income, but the proposal includes a larger exemption to offset the abandonment of the credit. The increased exemption has been discussed earlier in this paper.

The retirement income credit has two advantages most other tax measures lack: it is not so expensive in total, constituting less than 10 percent of the total tax benefits to those over 65, and the value of the benefit does not increase as the taxpayer's marginal tax rate rises.

However, the discrimination against wage income and the fact that almost 50 percent of the benefits go to persons with more than $6,000 adjusted gross income indicate that the same sum could be spent more effectively if the goal is to assure minimum incomes for the aged.

6. Conclusions

The tax measures that have been discussed do not exhaust the forms in which preference is given to older persons. There are or have been other provisions that give liberal medical deductions, reduce the property tax on homes of the elderly, and postpone the payment of tax on a gain from the sale of a residence, but these are minor factors in the total tax picture. The tax measures that have been discussed at length, and the tax treatment of closely related forms of income such as that from self-employment retirement plans, military retirement benefits, civil service retirement benefits, etc., are the source of most of the tax benefits.

These measures gave rise to an estimated $2.3 billion in tax reductions which, according to Treasury figures, were distributed among the elderly approximately as follows:

About 40 percent of this population had too little income to be taxable, even without the tax preference, and so received no benefit;

About 45 percent of the elderly had less than $5,000 of adjusted gross income but enough to have been taxable and they received about 50 percent of the tax saving;

The remaining 15 percent of the population had adjusted gross income over $5,000 and received the other half of the $2.3 billion in benefits.

It may be that this was the distribution of aid that was intended, but it does not accord with the usual emphasis on helping those with less than prescribed levels of income. Further, in the context of limited resources, more aid to one group means less aid to another.

A first step would seem to be the resolution of the questions raised by the subcommittee regarding the goals of income for the aged. Once this is done, tax favor may be considered as a form of implementation; but the disadvantages such as the shotgun nature of the device, its failure to benefit those who are not taxable, the complexity tax favor adds to the code, the uncertainty as to cost, the departure from the equal treatment of persons with equal incomes, and the usual distribution of benefits in direct proportion to income should all be considered before tax preference is adopted as the way to achieve the ends.

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SOME ECONOMIC EFFECTS OF HIGH TAXES FOR SOCIAL INSURANCE

BY ELIZABETH DERAN*

I. INTRODUCTION

Some people maintain that a dog around the house poses little trouble relative to the pleasures of pet ownership. But, more than one softhearted householder has found himself permanent heir to multiple descendants from an original pet. As the size of the pet population increases, small irritations become transformed into major problems, even though each successive animal may not differ from the original in any significant respect. The owner discovers that minor defects inherent in any pet and perfectly tolerable in small quantities at some point in an expansion become overwhelmingly disruptive.

Something of the sort threatens in the case of the payroll tax which finances the social security system.[1] No one can pinpoint the particular stage at which the shortcomings of the social security tax turn into serious problems, but it seems likely that the crucial period has already arrived, or certainly will arrive before the final stage of the presently scheduled increases has taken effect. When receipts from a tax account for 17 percent of total internal revenue collections, are 72 percent the size of the collections from the corporation income tax and 37 percent the individual income tax—as Treasury estimates for the OASDHI tax in fiscal 1967—then the tax surely has grown large enough that its effects become meaningful to the economy. When a tax has reached a level at which it can exert an important influence on business and family decisions, then surely the time has come to examine its characteristics carefully. We should consider to what extent this tax may be counterbalanced by other factors operating in the economy, whether its advantages compensate for its disruptions, how it might be modified, and then take appropriate action. Yet, very little attention has been directed to the tax aspects of the social security system since the early 1940's, although the other side of the coin—benefits—has evoked almost continuous discussion and publications.

This paper considers some of the economic distortions which might follow when the social security tax is levied at a high enough rate for its effect to be significant. The problems involved in changing to some

*Senior research analyst, Tax Foundation, Inc.

NOTE: The views expressed in this paper are the author's and do not necessarily reflect the views of the Tax Foundation.

[1] The term "social security" as used in this paper encompasses only the Federal old-age, survivors, disability, and health insurance (OASDHI) program, although in the national income accounts social security includes unemployment insurance, railroad retirement, civil service retirement, and other public systems.

other form of financing are examined, and some tentative suggestions for avoiding or reducing the more dangerous effects are offered.

The nature of the social security tax is such that its effect must be considered in the personal world of individual households and families as well as in the world of business and industry. Undeniably, these two sectors of the economy intertwine endlessly, but even the most simple story cannot be told in one breath. Since the effect of the OASDHI tax on the economy is far from simple, the analysis will be divided into two artificial groupings: the tax on employers and the tax on employees.

II. The Tax on the Employer

A corporation employing 10 persons, with net profits up to $13,000, pays more social security tax than Federal income tax.[2] The break-even point for a 15-employee firm lies at $19,773; for a 20-employee firm, at $26,154. Since no figures are available for net profit by employee size, one can only speculate how many firms fall below these break-even points. Clearly new businesses, those engaged in labor-intensive lines, and loss firms are most likely to accrue OASDHI tax liability in excess of their Federal income tax liability.

OASDHI taxes need not exceed corporation incomes taxes, however, before they exert pressure on entrepreneurial decisions. As a levy on a specific factor of production, this tax qualifies as a prime candidate for the deflection of business choices whenever its absolute amount reaches high enough levels that adjustments to reduce the tax become practical.

Taxes can exert an effect on the economy in two broad ways: (1) The taxpayer may take action to reduce the tax's pinch on himself, and his tax-reducing activity then initiates repercussions in the economy; or (2) the taxpayer may decide he cannot mitigate the effect of the tax (or learns from unsuccessful attempts that he cannot do so) and then makes adjustments to the lower income position in which he finds himself. The effects on the economy in case of (2) will not differ under two kinds of tax (say, a payroll tax and an income tax) of equal yield, provided the same taxpayers are subject to both taxes. But in case of (1), the nature of the tax can make a considerable difference in the available avenues of escape and the consequent effects on the economy. One would expect particularly differentiated behavior when the tax (viewed from the perspective of the employer) applies to a specific factor of production, as does the payroll tax financing the OASDHI system.[3] As it turns out, the OASDHI tax not only induces some general effects unlike those from other taxes; it appears also to affect one industry quite differently from another.

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[2] Counting the matching employer portion only and assuming salaries of $6,600 or more. Throughout this section generally, the assumption is made that the employer must contend with that portion of the tax levied directly on him, and only that portion. In at least one case, however, employees apparently were able to shift their tax to employers, and the possibility should be considered that the figures mentioned in this section should, at the outer limit, be doubled to take account of the contingency that employees may shift some or all of the tax to employers in the form of higher wages: (See Elizabeth Deran, "Changes in Factor Income Shares Under the Social Security Tax," scheduled to be published in the November 1967 Review of Economics and Statistics.)

[3] The same tax when viewed from the perspective of the employee applies to earnings but differs sharply from any income tax to which he ordinarily may be subject.

COMPARATIVE CAPITAL SUBSTITUTION INCENTIVES

Since the OASDHI tax applies to wages and salaries, an employer can reduce his tax liability by changing his factor mix so as to reduce labor utilization in achieving a given product goal. The most obvious approach lies in the introduction or expansion of laborsaving capital equipment. The practicability of such an adjustment, however, depends heavily on industry conditions.

The strength of at least four of the barriers to a tax-reducing substitution of equipment relates to industry conditions. Technical problems, high absolute cost, financing difficulties, and/or union opposition to substitution can present formidable obstacles in some industries, but never arise in others.[4] Technical problems unique to the industry can limit or preclude the availability of laborsaving equipment. For instance, despite years of experimentation, farm machinery engineers have failed to invent a practical machine to pick grapes. Vending machines can function as surrogate clerks, but in a sharply limited way. For still other industries, remarkable laborsaving equipment exists, but its absolute cost can be formidable, or its scale may prove unsuitable for any but the largest firms. Petroleum refining provides one such example. In yet other industries, an almost trivial piece of equipment, such as an electric screwdriver, can save considerable amounts of labor, yet financing difficulties may preclude even modest outlays for additional equipment. For example, mobile home manufacturers, as a group, report acute difficulty in obtaining financial support and generally must borrow from relatives or friends—a situation which makes substitution of laborsaving equipment a remote possibility. Union resistance to automation seems more determined in some industries—newspaper publishing, for instance—than in others, and may act as a significant barrier to an otherwise feasible change in labor-capital proportions.

In those industries where such difficulties can be overcome, there remains the question of the price at which a given piece of equipment, with known laborsaving potential and durability, should be purchased. The answer depends primarily on the current price of the contemplated equipment vis-a-vis the discounted cost of labor which will be saved over the expected life of the equipment.[5] The large increase authorized by the Social Security Act of 1965 (particularly the base increase from $4,800 to $6,600) makes a marked difference in the second variable, opening widely differing opportunities for tax-saving capital substitution which, while peculiar to one period, illustrates the general point that the significance of the payroll tax varies from one industry to the next. The increased base makes little difference in total tax liability in those industries where the average wage lies near the old base. But, the effect of the base increase is sharply felt in those industries where average wages exceed the old base, amounting to as much as $75 additional tax liability per employee in 1966 (considering the employer's share alone) and successively higher amounts in subsequent years as the rate automatically increases.

[4] Other variables associated with investment decisions—uncertainty of future tax treatment of capital goods, uncertainty as to the income stream which will be generated by the additional investment, and the risk of decreased flexibility in output levels associated with a larger fixed investment—seems less immediately linked to industry variables.

[5] Other considerations may include the effect of the substitution on the quality of output and associated changes in the amount of nonlabor inputs.

The OASDHI-induced increase in the discounted cost of an average worker for selected industries appears in table 1. The discounted present values (at 5 percent) of the OASDHI tax on one worker under previously scheduled rates and under the new rates [6] are computed for a 10-year period. Since in all but a few of the industries listed, the average annual wage exceeds the $4,800 base, the present value of the tax exhibits a relatively small range under the old rates. On the other hand, because the $6,600 base lies above the average for many of the listed industries, the present value of the tax under the new law varies widely by industry.

TABLE 1.—PRESENT VALUE OF EMPLOYER OASDHI TAX ON 1 WORKER, 1966–75, BY INDUSTRY

		1966 value of 1966–75 tax on 1 worker [2]		
	Average annual earnings [1]	Under prior law	Under 1965 amendments	Additional tax under 1965 amendments
All mineral industries	$6,800	1,670	2,459	789
Metal mining	7,200	1,670	2,459	789
Anthracite mining				
Bituminous coal and lignite mining	6,400	1,670	2,385	715
Oil and gas extraction	7,000	1,670	2,459	789
Nonmetallic minerals mining	6,500	1,670	2,422	752
All manufacturing industries	6,400	1,670	2,385	715
Food and kindred products	5,800	1,670	2,161	491
Tobacco manufacturing	4,800	1,670	1,788	118
Textile mill products	4,600	1,600	1,714	114
Apparel and other	3,900	1,357	1,453	96
Lumber and wood products	4,700	1,635	1,751	116
Furniture and fixtures	5,100	1,670	1,900	230
Paper and allied products	6,600	1,670	2,459	789
Print, publishing, etc	6,500	1,670	2,422	752
Chemicals and allied	7,600	1,670	2,459	789
Production of petroleum and coal	8,300	1,670	2,459	789
Rubber and plastic products	6,200	1,670	2,310	640
Leather and leather products	4,200	1,461	1,565	104
Stone, clay, and glass	6,300	1,670	2,347	677
Primary metal industries	7,600	1,670	2,459	789
Fabricated metal products	6,700	1,670	2,459	789
Machinery, except electric	7,300	1,670	2,459	789
Electrical machinery and services	6,600	1,670	2,459	789
Transportation equipment and ordnance	8,000	1,670	2,459	789
Instruments, etc	7,000	1,670	2,459	789
Miscellaneous manufacturing	5,200	1,670	1,937	267
All wholesale and retail trade	5,400	1,670	2,012	342
Wholesale trade	7,200	1,670	2,459	789
Retail trade	4,700	1,635	1,751	116
All services	4,300	1,496	1,602	106
Hotel, roominghouses, etc	3,700	1,287	1,378	91
Personal service	4,200	1,461	1,565	104
Miscellaneous business service	6,200	1,670	2,310	640
Automobile repair service	5,000	1,670	1,863	193
Miscellaneous repair service	6,600	1,670	2,459	789
Motion pictures	6,000	1,670	2,236	566
Amusement and recreation	4,900	1,670	1,826	156

[1] For 1965, rounded to nearest $100.
[2] At 5 percent compound interest, computed as follows: Value under prior tax=.34789W, W $4,800. Value under 1965 amendments=.372587W, W $6,600.

Source: U.S. Department of Commerce. The National Income and Products Accounts of the United States, 1929–65, table 6, 5, p. 109.

The differences between the two sets of discounted OASDHI tax values suggest how much more an employer can now consider paying for laborsaving machinery per labor unit replaced, as a consequence of the tax increase. The largest difference occurs in the industries with average salaries equal to or exceeding the new base. For instance, in

[6] The new rates for the employer portion of tax are 4.2 percent in 1966; 4.4, 1967–68; 4.9, 1969–72; 5.4, 1973–75. The rates continue to rise until they reach 5.65 percent in 1987; the base remains at $6,600 annually throughout. The old rates are: 4.125 in 1966–67; 4.625 in 1968; and thereafter, on a $4,800 base.

manufacturing of transportation equipment, to take one example, the value of the additional tax on one worker for 10 years comes to $789. Suppose a manufacturer of transportation equipment had been considering a piece of equipment which would last 10 years and replace 10 men, but, with a price somewhat too high. The 1965 amendment might make the contemplated investment worthwhile, since it increased by $7,890 the discounted value of the labor to be replaced. But, for such equipment the increased value of the replaced labor in the case of the operator of a hotel would amount to only $910; or of a retailer, $1,160.[7]

OTHER TAX ADJUSTMENT ACTION

Capital substitution, however, represents but one of many steps the employer might take to reduce the actual burden of his tax liability. The stub of table 2 outlines four other possible courses of action, plus the barriers which might interfere with successful implementation of each action. A moment's consideration of the table reveals that the strength of the barriers and the consequent appeal of each action largely depend on industry constraints.

TABLE 2.—ESTIMATED STRENGTH OF BARRIERS TO POTENTIAL TAX-ADJUSTING ACTIONS, 3 SELECTED INDUSTRIES

Potential action and barriers	Strength of barrier confronting—		
	Automobile manufacturer	Grapegrower	Department store owner
Action—Reduce wages, or withhold increases:			
Barriers:			
(a) Strong union	Strong	Weak	Moderate.
(b) Long-term contract in effect	....do	....do	Do.
(c) Demand for labor high	Moderate	Moderate	Weak.
(d) Employer's compassion	Weak	Strong	Moderate.
Action—Increase product price:			
Barriers:			
(a) Fear general sales reduction	Moderate	Moderate	Do.
(b) Fear loss of sales to competitors	....do	Strong	Strong.
(c) Fear antitrust authorities	Strong	Weak	Weak.
(d) Sufficient increases lead to awkward pricing	Weak	....do	Moderate.
(e) Generally low level of prosperity in economy	Moderate	Strong	Do.
Action—Substitute skilled workers:			
Barriers:			
(a) Insufficient supply of workers	....do	Moderate	Do.
(b) Substitution would not increase productivity enough.	Strong	Weak	Do.
Action—Reduce nonlabor costs:			
Barriers:			
(a) Suppliers not amenable to pressure	Moderate	Strong	Strong.
(b) Most nonlabor costs relatively fixed	....do	....do	Moderate.
Action—Substitute laborsaving capital equipment:			
Barriers:			
(a) Technical problems	Weak	....do	Strong.
(b) High absolute cost	Moderate	Weak	Weak.
(c) Financing problems	....do	Moderate	Moderate.
(d) Union opposition	....do	Weak	Weak.

Subjective estimates of the strength of each barrier have been made for three divergent industries chosen for illustrative purposes. The reaction of employers in each of these industries and the probability of successful tax-shifting activity turn out quite differently in each case. To take one possible course of action, wage rate deduction:

[7] Some simultaneous increase in the price of the machinery seems probable, the amount depending, in part, on how labor intensive the appropriate capital goods industry might be and how successfully it is able to pass on its own OASDHI tax increase via higher prices.
Because of the unavailability of data on which to base a meaningful adjustment for variance about the mean, table 1, to some degree, overstates the present value of the tax. In the case of those industry subgroups and individual workers who lie below the industry mean, the increase in the mean will not affect their present value, or will affect it less than the average indicated.

The necessity of dealing with a powerful union and the probability of a long-term contract currently in effect present formidable obstacles to the auto manufacturer, but virtually none to the grape grower and only moderate ones to the usual department store owner.

The level of demand for labor probably affects the department store owner least, since he can call on young people just entering the labor market, housewives, and, because of the timing of his peaks with respect to other businesses, moonlighting employees from other industries. The grape grower, on the other hand, cannot rely on such labor since his work calls for endurance and a degree of skill, and time pressures imposed by the nature of his product sharply limit the practicability of using moonlighters. Similar problems confront the auto manufacturer.

The employer's compassion seems most likely to interfere with wage reduction in the case of the grape grower, who generally obtains his workers from cultural groups with large families and consequently high levels of need compared with their relatively low wages. Since average earnings in auto manufacturing lie at approximately double those in retail trade, compassion introduces relatively little deterrent in the former and perhaps moderate deterrent in the latter.

All barriers considered, then, the auto manufacturer probably has little hope of decreasing wage rates, the grape grower perhaps can do so if his pity does not interfere, and the department store owner may have a reasonable chance of passing on the tax via wage cuts or withholding of raises.

Similarly, differences in the effectiveness of the barriers may be observed in connection with increasing the price of the product, substituting skilled workers,[8] reducing nonlabor costs, and substituting labor-saving capital equipment, not only for the three industries chosen for illustration in table 2, but for almost any group the reader might select from differing major industry categories. Employers in some industries will find they can implement several of the tax-adjusting actions with relative ease; others perhaps can undertake only one such action, and that with difficulty; yet others will be effectively blocked from any tax-adjusting action at all and consequently must bear the full weight of the tax themselves.

AVERAGE RATE OF A TAX BY INDUSTRY

One rather drastic, and necessarily longrun, adjustment to the tax comes about if employers change product or line of business in an effort to minimize the tax.[9] As long as all industries receive approximately equivalent treatment, such tax-induced movement would offer no gain. But, if the typical rate of tax varies from one industry to the next, a high enough rate can, over the long run, force entrepreneurs out of the heavily taxed areas and into the favored ones.

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[8] The advantage from using skilled workers relates to the base ceiling. For instance, three semiskilled employees at an annual salary of $6,000 each create (at 1967 rates) an employer tax liability of $836. If two highly skilled workers at $9,000 annually can produce equivalent output, total salary will be equal in both cases, but the OASDHI tax liability will come to only $580, for a tax saving of $256.

[9] This adjustment may not be made so much by existing employers as by new employers who enter a low-tax industry rather than a high-tax industry when the latter would be preferable on nontax grounds alone.

Because it is imposed on one cost of production—labor—the OASDHI tax falls with peculiarly uneven impact from one industry to the next. If the effective rate of tax is measured with respect to wages and salaries, the tax falls with relatively heavy force on labor-intensive industries. At the same time (and not predictably operating in either a compensating or reinforcing direction), the tax falls with comparatively light impact on those industries with average wages higher than the maximum tax base, since it applies at a uniform rate only up to a specified maximum of wages and salaries. In fact, by almost any measure one might select, social security taxes show a wide range in the intensity of their impact on differing industries.

Useful material on annual social security tax collections by industry has not been generally available. Fortunately, the Social Security Administration was able to provide unpublished data for 1963, a year in which the Department of Commerce conducted a number of full-scale economic censuses. Computations relating tax collection data to some of the industrial data available appear in table 3.[10]

Three ratios were selected: Tax liability as a percent of total wages (T/W), tax liability as a percent of value added (T/VA), and tax liability as a percent of value of shipments (T/VS). A comparison of T/W for a group of industries shows the relative impact of the tax considered as a levy on payroll; T/VA and T/VS illustrate how significant the tax is relative to other costs of production. Ideally, yet another ratio, with some measure of profits for the denominator, would have completed the picture, but suitable data could not be found.

TABLE 3.—EMPLOYER OASDI TAX LIABILITY AS PERCENT OF TOTAL WAGES, VALUE ADDED, AND VALUE OF SHIPMENTS, BY INDUSTRY, 1963

Industry	Total OASDI tax liability (millions)	OASDI tax liability as percent of —			Quartile [1]		
		Total wages	Value added	Value of shipments	T/W	T/VA	T/VS
All mineral industries	$100.07	2.68	0.63	0.46	------	------	------
Metal mining	13.04	2.50	.92	.61	1	1	2
Anthracite mining	1.88	3.20	1.56	.79	3	4	3
Bituminous coal and lignite mining	21.80	2.86	1.34	.91	2	2	4
Oil and gas extraction	44.06	2.56	.40	.30	1	1	1
Nonmetallic minerals mining	19.28	2.89	1.10	.82	2	1	4
All manufacturing industries	2,647.81	2.65	1.38	.63	------	------	------
Food and kindred products	255.56	2.96	1.17	.37	2	2	1
Tobacco manufacturing	12.31	3.72	.73	.27	4	1	1
Textile mill products	114.66	3.39	1.87	.73	4	4	3
Apparel and other	145.05	3.27	1.84	.85	3	4	4
Lumber and wood products	72.20	3.09	1.79	.78	3	4	3
Furniture and fixtures	52.27	3.03	1.70	.89	2	4	4
Paper and allied products	99.56	2.84	1.34	.61	1	2	2
Printing, publishing, etc	139.88	2.54	1.33	.87	1	2	4
Chemicals and allied	155.49	3.13	.88	.49	3	1	2
Production of petroleum and coal	36.64	3.23	.99	.20	3	1	1
Rubber and plastic products	65.18	2.76	1.40	.71	1	3	2
Leather and leather products	41.16	3.35	1.98	.98	4	4	4
Stone, clay, and glass	99.93	3.11	1.42	.81	3	3	3
Primary metal industries	202.68	2.62	1.34	.57	1	2	2
Fabricated metal products	188.33	2.95	1.60	.82	2	4	3
Machinery, except electric	262.04	2.74	1.52	.86	1	3	3
Electrical machinery and services	238.07	2.56	1.40	.80	1	3	3
Transportation equipment	301.56	2.58	1.32	.54	1	2	2
Instruments, etc	57.96	3.03	1.45	.95	2	3	4
Miscellaneous manufacturing	52.13	2.88	1.46	.80	2	3	3

Footnote at end of table.

[10] Less extensive but similar computations for 1957 and 1962 appear in "Economic Aspects of the Social Security Tax," New York, Tax Foundation, 1966, p. 22.

TABLE 3.—EMPLOYER OASDI TAX LIABILITY AS PERCENT OF TOTAL WAGES, VALUE ADDED, AND VALUE OF SHIPMENTS, BY INDUSTRY, 1963—Continued

Industry	Total OASDI tax liability (millions)	OASDI tax liability as percent of —			Quartile [1]		
		Total wages	Value added	Value of shipments	T/W	T/VA	T/VS
All wholesale and retail trade	1,449.40	3.17	------	.24	------	------	------
Merchant wholesale	518.08	2.86	------	.14	2	------	1
Building material and farm	62.60	3.62	------	.43	4	------	1
General merchandise stores	172.19	3.39	------	.47	4	------	2
Food stores	160.88	3.78	------	.28	4	------	1
Auto dealers and service stations	169.29	3.01	------	.27	2	------	1
Apparel and accessories	64.75	3.31	------	.46	4	------	2
Furniture and home equipment	49.05	3.19	------	.45	3	------	1
Eating and drinking places	144.32	3.55	------	.78	4	------	3
Miscellaneous retail stores	108.21	3.18	------	.36	3	------	1
All services [2]	383.95	3.15	------	.86	------	------	------
Hotel, roominghouses, etc	54.67	3.80	------	1.08	4	------	4
Personel service	95.64	3.26	------	1.04	3	------	4
Miscellaneous business service	117.23	2.86	------	.77	2	------	3
Automobile repair service	36.71	3.23	------	.67	3	------	2
Miscellaneous repair service	19.81	2.66	------	.66	1	------	2
Motion pictures	20.02	2.73	------	.74	1	------	3
Amusement and recreation	39.86	3.61	------	1.00	4	------	4

[1] Ranked from lowest to highest percentage, for all industries.
[2] Excludes services for which no matching data could be found (medical, legal, education, etc.).

Source: Computations based on unpublished data provided by Social Security Administration; Department of Commerce, 1963 Census of Mineral Industry, 1963 Census of Business, 1963 Census of Manufacturing.

Table 3 shows values of T/W for individual industries which range from 2.50 percent for metal mining (low tax, reflecting high average wages) to 3.79 percent (high tax, reflecting low average wages) for hotels and other lodging places. This is to say, the rate applying to hotels, etc., is about 50 percent higher than that applying to metal mining. Similar variation shows up within broad industrial groups. Mineral industries range from the previously cited low for metal mining up to 3.20 percent for anthracite mining. In manufacturing, printing and publishing have the lowest T/W, 2.54 percent; tobacco has the highest, 3.72 percent. Wholesale and retail trade run from 2.86 percent for merchant wholesalers to 3.78 percent for foodstores. Services range from 2.66 percent for miscellaneous repair service to the previously cited 3.79 percent for hotels and other lodgings.

T/VA varies from 0.40 percent for oil and gas extraction to 1.98 percent (five times higher) for the manufacture of leather and leather products. T/VS ranges from 0.14 percent for merchant wholesalers to 1.08 percent (seven times higher) for hotels and lodgings.

The answer to the question, "Which of the three measures provides the most realistic guide to how heavily the tax falls?" must remain subjective. For some lines, however, all three measures show similar relative positions. When the ratios for all 41 industries, listed in table 3, are ranked and divided into quartiles, six industries seem to be lightly taxed no matter the basis chosen, and seven others, heavily

taxed on any criterion. All three ratios are in the first or second quartile—i.e., lightly taxed relative to the median—for metal mining, oil and gas extraction, and four lines of manufacturing—food and kindred, paper and allied, primary metal, transportation equipment. All three ratios fall into the third or fourth quartile—i.e., heavily taxed relative to the median—for anthracite mining, and the manufacturing of four kinds of products—textile mill; lumber and wood; apparel, leather, and leather products; and stone, clay, and glass.[11]

For the majority of industries, the three measures indicate a mixed position. Perhaps these differences yield some hint as to which tax-adjusting action these industries are most likely to take. For instance, a firm whose T/W lies in the bottom quartile but whose T/VA and T/VS, in the upper ranges, might have more incentive to try to reduce wages or introduce laborsaving equipment. Conversely, a low T/VS and a high T/VA and T/W might incline a firm more toward attempting price increases.

ESTIMATED RESOURCE MISALLOCATION

The preceding material points up an important disadvantage of the social security tax: an undeniable lack of neutrality. We can reasonably anticipate that the interindustry tax rate differentials, and opportunities for successful tax-adjusting behavior, will lead to changes, with the net result a waste of some resources. Assuming that the pretax pattern of production (in terms of input techniques and output composition) was as efficient as possible under all existing constraints aside from the tax, then any changes made in response to the tax necessarily will move the economy to a less efficient position.[12]

Some notion of how much tax distortions cost the economy can be obtained by applying a method developed by Harberger for a similar purpose in connection with the corporation income tax.[13] Harberger has observed that "meticulously exact" results necessarily elude the economist who aspires to measure waste, but adds that even estimates with "substantial error" can be helpful in areas where intuitive judgment is the alternative.[14] It is in such a spirit that the computations in table 4 are presented. The absolute figures should be considered a first approximation of the roughest sort, but nonetheless a better guide to the underlying reality than the alternative—an uninformed guess.

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[11] In the case of those industries for which only T/W and T/S could be computed, both measures fell into Q1 or Q2 for three lines (merchant wholesalers, auto dealers and service stations, and miscellaneous repair services) and into Q3 or Q4 for four lines (eating and drinking places, hotels and lodging places, personal service, amusement and recreation).

[12] It is my tentative belief, developed at greater length under the effect on the employee, that such pretax efficiency does not necessarily exist, as a consequence of ordinary human inertia. Under such circumstances, a tax increase can have a triggering effect on the taxpayer, forcing him to take advantage of maximizing opportunities which have developed since he last assessed his position, and possibly improving economywide resource allocation.

[13] Arnold C. Harberger, "The Corporation Income Tax: An Empirical Appraisal," in U.S. Congress, Committee on Ways and Means, Tax Revision Compendium, November 1959, pp. 231–250.

[14] Harberger, "The Measurement of Waste," American Economic Review, May 1964, pp. 58–76.

TABLE 4.—ESTIMATED COST OF DISTORTION UNDER OASDI TAX ON EMPLOYERS, SELECTED INDUSTRIES, 1963

	OASDI tax (millions)	OASDI tax as percent of national income originating in industry	Industry percentage minus average percentage	Cost of distortion (millions)
	(1)	(2)	(3)	(4)
Farms	$81.0	0.46	−1.16	$117.1
Agricultural services, forestry, and fisheries	19.5	1.62	----------	0
Metal mining	13.0	1.62	----------	0
Coal mining	21.8	1.82	+.20	2.4
Crude petroleum and natural gas	44.1	1.52	−.10	(1)
Mining and quarrying of nonmetallic minerals	19.3	1.93	+.31	(1)
Contract construction	495.2	2.05	+.43	22.3
Food and kindred products	255.6	1.91	+.29	5.6
Tobacco manufactures	12.3	1.02	−.60	2.2
Textile mill products	114.7	2.44	+.82	15.8
Apparel and other fabricated textile products	145.0	2.54	+.92	24.1
Paper and allied products	99.6	1.92	+.30	2.3
Printing, publishing, and allied industries	139.9	1.92	+.30	3.3
Chemicals and allied products	155.5	1.50	−.12	(1)
Petroleum refining and related industries	36.6	.80	−.82	15.4
Rubber and miscellaneous plastic products	65.2	1.98	+.36	2.1
Leather and leather products	41.2	2.42	+.80	5.4
Lumber and wood products, except furniture	72.2	2.00	+.38	2.6
Furniture and fixtures	52.3	2.18	+.56	3.8
Stone, clay, and glass products	99.9	1.96	+.34	3.0
Primary metal industries	202.7	1.76	+.14	1.2
Fabricated metal products	188.3	2.05	+.43	8.5
Machinery, except electrical	262.0	1.87	+.25	4.3
Electrical machinery	238.1	1.93	+.31	5.9
Transportation equipment and ordnance	356.6	1.61	−.01	(1)
Instruments	58.0	1.66	+.04	(1)
Miscellaneous manufacturing industries	52.1	2.08	+.46	2.6
Local, suburban, and highway passenger transportation	45.2	2.66	+1.04	9.2
Motor freight transportation and warehousing	139.8	2.03	+.41	5.8
Water transportation	38.2	2.12	+.50	2.2
Air transportation	35.8	1.88	+.26	(1)
Pipeline transportation	3.7	.92	−.70	(1)
Transportation services	12.1	2.02	+.40	(1)
Communication	129.1	1.32	−.30	4.4
Electric, gas, and sanitary services	112.4	1.09	−.53	14.4
Wholesale and retail trade	1,449.4	1.97	+.35	44.8
Banking, credit agencies, holding and other investment companies	152.9	2.01	+.39	5.8
Security and commodity brokers	19.6	1.40	−.22	(1)
Insurance carriers, brokers, and real estate	236.1	.53	−1.09	264.9
Hotels and other lodging places	54.7	2.28	+.66	5.2
Personal services	95.6	1.80	+.18	(1)
Miscellaneous business services	117.2	1.78	+.16	(1)
Auto repair, auto services, and garages	36.7	1.67	+.05	(1)
Miscellaneous repair services	19.8	1.52	−.10	(1)
Motion pictures	20.0	2.23	+.61	1.7
Amusement and recreation services, except motion pictures	39.9	2.00	+.38	1.4
Medical and other health services	223.6	1.66	+.04	(1)
Legal services	22.7	.67	−.95	1.5
Nonprofit membership organizations	77.5	1.68	+.06	(1)
Miscellaneous professional services	65.5	1.39	−.23	1.2
All industries listed above [2]	6,489.2	1.62	------	612.4

[1] Less than $1,000,000.

[2] Excludes railroad transportation, education services, private households, government and government enterprises, rest of the world.

Source: Department of Commerce, "The National Income and Product Accounts of the United States, 1929-65," pp. 20-21; unpublished data provided by Social Security Administration.

The rationale of table 4 is that we may obtain some clue to the effect of tax distortions on the structure of production by comparing results under the existing tax with results under a theoretical flat rate tax of equivalent yield, levied on each industry in proportion to its contribution to national income. The latter tax would be essentially neutral in its effects.

Column 2 suggests the distortions inherent in the OASDI tax. The tax, taken as a percentage of national income originating in each industry, amounts to an average of 1.62 percent for all the industries

considered, but ranges from as low as 0.46 percent for farms to as high as 2.66 percent for local, suburban, and highway transportation. Column 3 presents the same information as column 2, but subtracts the average percentage from each industry percentage to underline that some industries suffer "overtaxation" and others enjoy "undertaxation."

Estimates of the cost of the tax distortion, based on two probably unrealistic but computationally helpful assumptions, appear in column 4. These two assumptions are (1) that employers pass the tax forward in the form of price adjustments, and (2) that the price elasticity of demand approximates unity in all industries concerned. Granted these assumptions, it follows that, because the tax-induced change in price results in an equal percentage change in quantity in the opposite direction, production will be higher in an undertaxed industry, and lower in an overtaxed industry, than under neutral taxation.

Harberger has demonstrated that the cost of distortion, given the two preceding assumptions, can be approximated as follows:

Under neutral taxation, consumers could buy previously overtaxed products for a lower price and would have to pay more for previously undertaxed products. Assuming an approximately even distribution of consumer preferences, the cost of distortion can be represented graphically by a triangle whose height equals the percentage in column 3 of table 4 times the initial price, and whose base is this same percentage times the initial quantity. For example, in the case of the contract construction industry, the area of this triangle equals (0.0043) (0.0043) (0.5) = 0.00092 times the value added in the industry, $24.2 billion. The result of the computation, $22.3 million, is shown in column 4.

All told, the uneven taxation illustrated in table 3 resulted in an underproduction in some lines and overproduction in others, for a total cost of distortion of roughly $660 million.

On the heels of such apparent precision, I wish to reiterate that the figures in table 4 are meant to do no more than indicate order of magnitude, particularly with reference to the current situation. Quite aside from the conceptual limitations of the mathematical approach,[15] there is the further problem that since 1963 the relationships shown in column 2 have changed, primarily because the ceiling on the social security tax base has risen from $4,800 to $6,600 and the rate, from 3.625 to 4.4 percent. Nonetheless, the basic point of the table cannot be brushed aside: while the exact amount remains vague, undoubtedly the social security tax results in some degree of wasteful application of the economy's resources.

III. The Tax on the Employee

IMPACT ON FAMILY BUDGETS

For many taxpayers, the portion of tax levied on the employee resembles an income tax. in a very peculiar version. For lower and median income ranges, the OASDHI tax often takes a larger fraction of the family budget than the Federal income tax, especially when

[15] See Harberger, "The Corporation Income Tax: An Empirical Appraisal", op. cit., pp. 235–236.

the family is large. Even for the relatively small family of four (parents and two children), the typical breakeven point below which the social security tax exceeds the income tax lies at $5,027, at 1967 rates (table 5). Latest available estimates indicate that about 23 percent of the families this size earn income lower than the break-even income. With three children, the break-even point rises to $6,263 and the percentage of families affected, to about 35 percent; with 4 children, $7,106 and about 47 percent; with five children, $7,654 and about 62 percent. About 35 percent of the families with at least two children pay more social security tax than Federal income tax.

One widely discussed characteristic, the apparent regressivity resulting from the flat rate and base ceiling, raises interesting issues of equity, welfare, and differential spending patterns.[16] But the basic problems and conclusions differ little from those which would arise in connection with a regressive income tax, have been discussed extensively, and will not be reexamined here.

TABLE 5.—BREAK-EVEN POINT, FEDERAL INCOME TAX AND SOCIAL SECURITY TAX, BY FAMILY SIZE, 1967 RATES

Family size	Breakeven point [1]	Percent of families with income below breakeven point [2]
Parents, 2 children	$5,007	23
Parents, 3 children	6,029	35
Parents, 4 children	7,116	47
Parents, 5 children	7,654	62
Parents, 2 or more children	----------	35

[1] Annual income below which social security tax exceeds Federal income tax, based on 1967 rates. Assumes only 1 parent is employed and that a joint income tax return is filed.
[2] Based on latest available distribution, for 1965 income.

Source: Bureau of the Census, "Income in 1965 of Families and Persons in the United States" (series, p. 60, No. 51), (January 1967, p. 21).

PRESSURES FOR WAGE INCREASES

The OASDHI base ceiling may create a unique problem, since it causes many taxpayers to experience a discontinuity of take-home pay. As a consequence of the method by which the tax is levied, a taxpayer earning, say, $9,000 (about 30 percent of families reported income of $9,000 or higher in 1965) paid a monthly social security tax of $31.50 for the first 8 months of 1966 (4.2 percent of a monthly salary of $750) plus $25 in the ninth month. During October, November, and December, the family received monthly take-home pay $31.50 larger than during the first 9 months of the year. A great deal then depends on what the taxpayer chooses to do with his additional take-home pay. If he merely saves it, or even if he regards it as a temporary bonanza, no particular problem arises. But, if he has no tax awareness, and casually spends the extra money, he well may make an unnoticed upward adjustment in his standard of living, and will find the jolt quite

[16] The issue of the regressivity of the tax should be evaluated in a broader perspective not essential to the discussion here. See E. Deran, "Income Redistribution Under the Social Security System," National Tax Journal, vol. 19, No. 3 (September 1966), pp. 276–285.

painful when once again OASDHI is withheld from his paycheck in January. It seems possible that such a stimulus might trigger him to press for an increase in a salary level he previously considered adequate.

The theoretician may protest that such an effect would have no importance, on grounds that both employer and employee seek maximizing positions with resultant equilibrium precluding any wage negotiations in response to purely psychological phenomena. But, it seems to me that maximization theories, no matter how venerable, overlook the common human tendency to feel indifferent to small inequities and inefficiencies. If we may judge by the works of early English novelists, the business world known to Adam Smith may have been a good deal more responsive to the "invisible hand" than the economy of today. In fact, a person exhibiting a relentless drive for profit maximization today may seek treatment for a "competition neurosis." In a society where relatively few find themselves at a subsistence level, it is hard to believe that typical employers and employees continuously assess their economic position with a view to maximizing returns. I suspect that employees in particular do not engage in frequent evaluations, since the opportunity cost of constant alertness ordinarily would be forgone leisure. Consequently, it seems probable that employees might overlook the development of opportunities for a wage increase until some minor trauma such as the January reduction in take-home pay awakens them to their neglected opportunities.[17]

OTHER ADJUSTMENTS TO TAX

It will not always happen, of course, that the employee can bargain successfully in his try for a wage increase. In that case, he must make some sort of adjustment to reduced take-home pay. The most probable alternatives: Reduction of consumption expenditures, reduction of saving (or increased borrowing), increased pretax income through an additional job or overtime. The effects of these adjustments, in no way unique to the social security tax, have been analyzed frequently and at length in textbooks and journal articles, and need not be spelled out here.

A possible subtle effect of the tax might be noted in passing, although it is not amenable to proof by any means other than intuition. From one point of view, it might be held that the tax "discriminates" against the low-paid, unskilled worker, via the incentives it creates for employers to substitute more productive, skilled workers when practicable.[18] Consequently, at high enough rates the tax might accentuate other influences in the economy which reduce the supply of jobs for the unskilled, with adverse effects on employment levels. What response the unskilled worker might make to this situation cannot be predicted. He may sink into permanent apathy and despair, he might engage in rioting, or he might seek training which would move him into the ranks of the semiskilled.

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[17] Just such a case may have occurred in Puerto Rico when the tax was introduced there in 1951. See footnote 3 above. It should be noted that the employer can experience a similar jolt, multiplied by the number of his employees.

[18] See footnote 8 above.

IV. General Revenue Financing as an Alternative

The preceding discussion makes it clear that the OASDHI tax, like any other tax, exhibits the usual quota of faults, all of which become more acute as the level of the tax rises. In view of these shortcomings, should we abandon the present method of financing the social security system by turning in part to general revenue financing, as some have suggested?

There is one immediately apparent "advantage" to supplementing the finances of the system with funds from general revenues: benefit levels probably could be increased substantially without any further increases in payroll taxes, which possibly could even be frozen at their present level. While such a possibility may offer considerable appeal, it is important to think a few steps beyond such a nirvana before merging into it.

What, actually, does general revenue financing imply? Although there is temptation to think of general revenue as a never-failing cruse, in fact it is merely the conglomerate of collections from nonearmarked taxes. In 1966, about 88 percent of Federal revenue came from income taxes (about two-thirds from individuals and the balance from corporations), 9 percent from excise taxes, and 3 percent from estate and gift taxes. For all practical purposes, then, general revenue financing amounts to income tax financing. It follows that general revenue financing for the social security system would require a choice between two unpleasant alternatives: scuttling of some present areas of expenditure—an unlikely prospect—or imposition of income tax rates higher than would otherwise be necessary.[19] A capsule idea of the consequences of general revenue financing can be obtained by comparing the major ways in which payroll taxes and income taxes differ, as shown below:

	Increase in payroll tax	Increase in income tax
Effect of increased tax on resource allocation.	May be severe on new and marginal firms (taxes all firms).	Allows new firms to develop, marginal firms to survive (taxes profitmaking firms only).
	Especially severe on labor-intensive firms.	Especially severe on firms using large amounts of equity capital.
	Induces movement of resources to less heavily taxed industries.	Little, if any, tax-induced industry shifts.
Effect of increased tax on economic stability.	No predictable relationship to business cycle.[1]	Some degree of built-in stabilizer.
Effect of increased tax on individuals..	Possibly regressive	Progressive.
	Benefits seem earned (tax-benefit link possible).	Benefits are charity (no tax-benefit link possible).

[1] See Economic Aspects of the Social Security Tax, Tax Foundation, New York, 1966, pp. 51–54.

When the major differences between the two taxes are thus arrayed, the choice between financing additional benefits by increasing one tax rather than the other begins to look like the Scylla-Charybdis passage. For instance, one might prefer the income tax because it allows new firms to develop, but since the income tax also allows inefficient marginal firms to continue to operate, perhaps the OASDHI tax, with

[19] This paper does not seem the place for a discussion of "fiscal drag," but for those who would contend the "surplus" could be channeled into the social security system, let it be noted that the "excess" funds would vanish under suitable rate reduction.

its harsher treatment of marginal firms, would be preferable. The income tax and payroll tax, in fact, would appear to be a nicely complementary pair, as long as both are kept below seriously repressive levels. In any event, it obviously would be unrealistic to contend that the faults of the social security tax exert a more oppressive effect than those of the income tax, since both can exhibit extremely unpleasant characteristics as rates increase.

V. A Way Out of the Dilemmma: Realistic Approaches to Costs

I have attempted to show that the OASDHI tax leads to a number of undesirable effects. Raising equivalent funds through general revenue financing may reduce some of the problems, but only at the expense of aggravating another set of difficulties. It would seem that the taxpayer has been boxed into a depressing trap.

Sometimes, however, traps are more of the captive's own devising than externally imposed. There is a weak point in the social security system, which just possibly may provide an avenue of escape: the assumption that the costs of the system must continue to increase.

In the past, three important factors have led to the need for increasing taxes to finance the social security system:

1. The anticipation that benefits must be increased to maintain a decent standard of living for our elders.
2. The intergeneration transfer, which will continue to some degree until the early part of the next century.
3. The interbracket income redistribution which has been quietly increased in intensity, with resultant changes in the entire philosophy of the system.

Before we abandon all hope, perhaps we should consider the importance of each of these elements for the integrity of the entire system, and whether and changes might be made which would ease the financing pressures.

BENEFIT LEVELS

Like many others of my generation, I was brought up in an American subculture which respects old age, and would be among the first to agree that our elders should be able to live in comfort and dignity. I also agree with Jung that old age is a time for retrospection and introspection, a time to prepare for whatever lies beyond, and concede that this vital task certainly cannot be accomplished under economic pressure. I nonetheless feel that the time has come to consider the matter of increasing benefits in a realistic framework.

The basic problem stems from considering the social security pension as providing the older person's entire support, rather than as the floor it was originally meant to be, and in fact is, for many of the retired. In evaluating the adequacy of benefits, several points must be remembered. Older people generally have accumulated assets which reduce their outlays (such as a house) and often, in addition, income-bearing assets. Increasing numbers receive supplemental income from private pensions. Still others are capable of and would benefit from part-time, light work that would enable them to bring their combined pension-earnings income to a comfortable level but for the strictures imposed by the social security system. At the same time, it must be

recognized that substantial numbers of the elderly depend almost entirely on their OASI pensions.

For example, consider the archetypal cases of three sisters, all widows on social security, whose personal circumstances neatly illustrate the problem and point a way to a solution. Mrs. A was married to a barber, a wonderful man who told marvelous stories but never was able to save a dime. Mrs. A quickly ran through the few assets he left, and really can't live on her pension. Her highest skill is baby-sitting. Her sister, Mrs. B, is a competent woman with a keen business sense who was left a good farm. She would very much like to operate the farm herself, but instead, because of earnings limitations, must rent it if she wants to collect her OASI pension. She has enough income, but worries constantly about the failure of her tenant to take a long-run view in his management of the farm. Mrs. C, on the other hand, married a man who died a millionaire; so, she has no worries about money at all.

The question is, should the pensions of Mrs. B and Mrs. C be increased so that Mrs. A can live decently? When the problem is put in the perspective that comes from thinking about real people (as distinct from "the elderly" or "the poor"), it is clear that Mrs. A's needs should be met in a framework that would not waste funds on the other two. Mrs. A needs welfare; the other widows do not, although Mrs. B would benefit from an easing of the earnings limitation. It would be wasteful to extend welfare to all three in the form of social security benefits high enough to meet Mrs. A's need.

How high, then, should benefits be? The answer, I think, is that they should be as high as can be supported by today's level of payroll tax—which, after the adjustments suggested in the next two sections, may be considerably higher than present levels. Anything more should be treated as welfare, and handled outside the social security framework.

THE INTERGENERATION TRANSFER

No one now receiving an OASI pension has paid social security taxes all his working life. In fact, a 21-year-old man who entered the labor force when the social security system first began in 1937 will not normally retire until 1981. The consequence, as shown in table 6, is that the cumulative value of taxes at 3.5 percent compound interest falls quite a bit short of the discount value, also at 3.5 percent, of probable benefits in the case of pensioners retiring relatively early. Generally, single individuals retiring before 1990 and married men retiring before 2010 receive a windfall. But, the table also illustrates who pays for the windfall: the younger participants, the value of whose taxes massively exceed their probable benefits. For instance, if he lives out his normal lifespan a single male entering the work force in 1965 will pay (not counting matching payments from his employer) OASDI taxes with about $12,800 more than the discounted benefits he can expect, computed on the basis of implicit 3.5 percent interest under existing law.

Where does the $12,800 go? No chicanery is involved: someone has to pay for the pensions of those who have not been covered by the system long enough to pay their own way competely. This transfer of funds from the younger generation to the older generation is an extremely important reason for the present high rates of tax.

TABLE 6.—VALUE OF TOTAL EMPLOYEE TAXPAYMENTS AND BENEFITS, AND TAXPAYMENTS AS PERCENT OF BENEFITS, SELECTED RETIREMENT YEARS, 1962–2010

Year of retirement	Value of taxpayments at 3.5-percent interest [1]	Value of benefits discounted at 3.5 percent [2]			Value of taxpayments as percent of value of benefits		
		Single male	Married male	Single female	Single male (percent)	Married male (percent)	Single female (percent)
1962	$1,981	$14,995	$25,225	$17,437	13.2	7.9	11.4
1965	2,270	15,483	26,050	18,227	14.7	10.4	14.9
1970	4,567	16,797	28,270	18,639	27.2	16.2	24.5
1980	10,144	17,960	30,235	20,234	56.5	33.6	50.1
1990	16,830	18,425	31,021	20,899	91.3	54.3	80.5
2000	25,225	19,239	32,397	21,963	131.1	77.9	114.9
2010	32,496	19,704	33,183	22,495	164.9	97.9	144.5

[1] Based on social security law as amended in 1965. Assumes worker is employed (as an employee) at maximum covered earnings in all years after 1937, or after attaining age 20, if later. Excludes portion of tax earmarked for health insurance, and entire employer tax. Taxpayments are the same for single male, married male, and single female.
[2] Assumes worker is alive at age 65 and retires at that time (attaining age 65 at the beginning of the year). Married worker and his wife are the same age.

Source: Unpublished computations prepared by Ray M. Peterson, formerly vice president and associate actuary, the Equitable Life Assurance Society of the United States.

One comfort about the intergeneration transfer problem is that time alone will heal it, provided, of course, it doesn't damage the system irreparably before then. Something along the lines suggested by Professors Buchanan and Campbell might reduce the current strain on the system: a bookkeeping adjustment which would treat the cost of the intergeneration transfer as a national debt (and hence chargeable against general revenues), rather than an obligation on the social security trust fund.[1] This done, it likely would be possible to reduce social security taxes while maintaining present benefits or, alternatively, increase benefits considerably while freezing rates at their present level.

INTERBRACKET INCOME REDISTRIBUTION

The social security system has always included some degree of redistribution from high- to low-income levels, with lower paid workers receiving pensions representing a higher percentage of their average taxable income than was true of taxpayers at the upper end of the spectrum. The redistribution element has gradually increased over the years, particularly with respect to those pensioners receiving benefits determined by the legal minimum. Minimum pension beneficiaries (who may or may not be low-income beneficiaries) have enjoyed relative gains because the level of the floor has gradually increased, while the level of qualifying earnings has remained stationary.

The ratio of the basic monthly benefit to average monthly taxable wages (B/W) may be taken as a rough comparative indicator of how much a beneficiary is getting back, relative to what he paid in taxes. In a comparison of two beneficiaries, the one with the higher B/W may be considered the gainer, because he gets more back for each tax dollar he pays in. Over time, income will be redistributed from the low B/W beneficiary to the high B/W beneficiary, since the latter gets a better bargain than the former.

Table 7 shows B/W for three categories of taxpayers under provisions of all benefit schedules to date, plus under the current Presi-

[1] James M. Buchanan and Colin D. Campbell, "Voluntary Social Security," Wall Street Journal, Dec. 20, 1966. The Buchanan-Campbell proposal is considerably more intricate than I have indicated above, and includes a proposal that taxpayers be allowed to withdraw from the system. I am not convinced that the complete plan is workable unless drastic changes can be made in the income redistribution elements of the system.

dential proposal. The first column gives B/W for beneficiaries earning the highest level of taxable wages; the second column, for beneficiaries who received the legal minimum because their qualifying wages were so low the ordinary rules for computing benefit levels did not apply; the third, for beneficiaries just above the floor, a category we perhaps could consider the "normal" low-wage taxpayer.

TABLE 7.—RATIO OF MONTHLY BASIC BENEFIT TO AVERAGE TAXABLE WAGES, SELECTED BENEFIT LEVELS, 1939–65

Year enacted	Average monthly taxable wages as multiple of monthly benefit			Col. (2) as multiple of col. (1)	Col. (3) as multiple of col. (1)
	(1) Maximum wage	(2) Minimum wage qualifying [1]	(3) Minimum wage not dependent on benefit floor [2]		
1939	.24	.6	.40	2.5	1.7
1950	.27	1.2	.50	4.4	1.8
1952	.28	1.5	.55	5.4	2.0
1954	.31	1.8	.55	5.8	1.8
1958	.32	2.0	.59	6.2	1.8
1961	.32	2.4	.59	7.5	1.8
1965	.31	2.6	.63	8.5	2.0
Increase, 1939–65 (percent)	29.2	333	57.5	240.0	17.6
Presidential proposal	.32	4.2	.72	13.5	3.4

[1] Assumes $50 earned per quarter in all 4 quarters each year employed (see text footnote 22).
[2] Equal to $25 in 1939; $40 in 1950; $45 in 1952; $54 in 1954; $56 in 1958; $68 in 1951; $70 in 1965.

Source: Computations based on Robert J. Myers, Old-Age, Survivors, Disability and Health Insurance Provisions: Legislative History, 1935–65, Social Security Administration, July 1965; Committee on Ways and Means, Section-by-section analysis and explanation of provisions of H.R. 5710, the "Social Security Amendments of 1967 * * *", February 1967.

B/W has increased for all three categories. For beneficiaries earning the maximum wage, it increased from 0.24 in 1939 to 0.31 in 1954, where it stands today. For the normal-low wage beneficiary, B/W began at 0.40 in 1939, and has risen gradually to 0.63 today. In striking contrast, B/W for those receiving the minimum benefit has risen from 0.6 to 2.6 today.[2] Over the 26 years since 1939, B/W increased about 29 percent for the high-wage beneficiary, 57 percent for the normal-low wage beneficiary, and 333 percent for the minimum benefit category.

Inevitably, the uneven changes in B/W brought changes in the relationship among the three categories. B/W for the normal-low wage category began 1.7 times as large as the B/W for the high-wage category, then slowly increased until today is 2 times as large as the latter. B/W for the minimum category began at 25 times the high category, rapidly increasing to 8.5 times in 1965.

The President's proposal would accelerate the trend of the past quarter century to an incredible degree. B/W would remain unchanged at 0.31 for high beneficiaries, and shoot to 4.2 for minimum beneficiaries. Under this proposal, B/W for normal-low beneficiaries would be 3.4 times as large as for high beneficiaries, while B/W for minimum beneficiaries would be 13.5 times as large as for high beneficiaries and 4 times as large as for normal-low beneficiaries.

[2] The base used for estimating the minimum wage was conservatively set at $16.67, on the basis that since the beginning of the system, $50 earnings in a quarter will give a taxpayer a quarter of coverage. A representative of the social security regional office, New York City, has pointed out to me that present law specifies a person is covered if he has one such quarter of coverage for every year which has elapsed since 1951, or, in effect, average monthly earnings of $4.17 since that date. I prefer to assume my low-wage taxpayer earned $200 a year, rather than the $50 which could qualify him, on the practical ground that a $4.17 base would lead to results that, while technically correct, would appear too ridiculous to believe.

Most people would take the view that, despite the truly astonishing relationship between the upper and lower ends of the benefit schedule, the minimum benefit considered in the absolute provides a pathetically low income. Obviously, not even an ascetic could manage on the present $44 per month, or even on the $70 suggested by President Johnson. In fact, it is impossible to use the social security system to provide a suitable income for people at the lower end of the income spectrum unless we are willing to junk the entire underlying philosophy and transform the social security system into a particularly wasteful welfare mechanism.

Another point to consider is the fact that an unknown proportion of those receiving minimum benefits have not necessarily been low-income earners. For instance, there is the case of an astute lady who was anticipating retirement from administrative work in a public school system not at that time under social security. She persuaded her brother, who owned a large department store, to hire her to tie bows for gift wrapping, spending just enough time at the chore for the $50 quarterly earnings requisite for coverage. As she pointed out, she certainly didn't need the income from bow tying, but it was silly to pass up the social security for which she could so easily qualify, and she accumulated quarters of credit just as assiduously as she accumulated growth stock.

Unfortunately, the Social Security Administration was unable to provide direct information on the percentage of minimum-level beneficiaries who fall into relatively high income categories. Table 8, which is based on the Social Security Administration's 1963 survey of the aged, provides some indirect information which suggests that married couples [3] receiving the minimum level of benefits are not necessarily the most disadvantaged group. While only 45 percent of the beneficiaries in the $40 primary insurance amount (PIA) category received retirement income other than their social security pension, the median value of this income lay at a higher point for the lowest PIA than for any other PIA category. In fact, retirement income other than OASDHI for the minimum PIA group was 20 percent larger than for either the highest PIA or the "normal"-low PIA, and double the value of the middle PIA category.

TABLE 8.—RETIREMENT INCOME AND SOURCE, BY PRIMARY INSURANCE AMOUNT, MARRIED COUPLES, 1962 [1]

	Primary insurance amount			
	$40	$41 to $59	$60 to $99	$100 and more
Retirement income other than OASDHI:				
Median amount	$1,215	$1,000	$605	$1,000
Percent with such income	45	54	67	87
Percent with retirement income from:				
Employer pensions, public and private, other than OASDHI	15	11	14	39
Veterans' pensions and compensations	15	21	14	16
Assets	32	39	57	77
Private annuities	3	2	3	6

[1] Does not include retired married women whose husbands are not entitled to OASDHI.

Source: Leonore A. Epstein and Janet H. Murray, "The Aged Population of the United States," Social Security Administration, Office of Research and Statistics, Research Report No. 19 (scheduled for publication July 1967), pp. 328-331.

[3] While table 9 shows data for married couples only, similar relationships among PIA groups appear for nonmarried beneficiaries. However, the actual figures, particularly dollar amounts, differ considerably. Data for various categories of single beneficiaries may be found in the source cited for table 8.

An examination of the sources of non-OASDHI retirement income (table 8), which include public and private employer pensions, veterans' pensions, income from assets, and private annuities, suggests that low PIA beneficiaries may derive their supplementary retirement income primarily from public pensions. Generally, the percentage receiving income from each source is not notably larger, and is sometimes smaller, for the minimum group compared with other groups. However, the fact that the percentage receiving employer pensions in the minimum PIA group is second only to the percentage for the highest PIA group seems curious, since one might deduce that pensions from a private employer (i.e., in employment covered by OASDHI) could not be substantial if an individual qualifies for no more than a minmum OASI pension. Hence the conclusion follows that 45 percent of the low PIA group probably have retired under public programs such as Federal civil service or railroad retirement, receiving pensions large enough to account for their highest "other" retirement income cited above. Obviously, it is easily possible for employees of Federal civil service, railroads, and State systems not linked to social security to qualify for minimum benefits by taking part-time jobs in covered industries for a few years. The higher the minimum benefit, the more these people will be tempted to take the trouble to qualify. If, on the other hand, the needs of the genuinely poor were met through a welfare arrangement outside the social security system, few of those retired under other government programs would qualify for the heavily subsidized minimum pensions.

Conclusion

An important choice lies before Congress today. It can transform the social security system into a peculiar sort of welfare program, or can make the repairs that will return the system to the sound principle of an earned pension for all Americans. If the former is the goal, then Congress may as well swing over to general revenue financing, which can best support the spiraling costs which inevitably will ensue. But, if Congress wants something resembling the original system, with its liberating tax-benefit link—a system, I think, best fits the American ideals of independence and self-respect—then it must attend to the major peril to that system, the excessively high costs which require dangerously high payroll taxes.

Two important steps will go far toward reducing costs without undermining the philosophy or financial soundness of the system.

(1) The cost of the one-time-only intergeneration transfer should be identified—a difficult but not impossible chore—and subsidized out of general revenue. Such an adjustment would relieve the financial pressures on the system without opening a Pandora's box to benefit levels supported out of seemingly limitless funds.

(2) The concept of the minimum benefit should be recognized as a wasteful device which has reached an inappropriately high level relative to the rest of the benefit schedule. While it might be politically unrealistic to scrap the concept altogether, the minimum should be restored to a more reasonable point relative to other benefits.

Action suggested under step (1) will make possible an overall increase in benefits without accompanying increases in rates or base, but it is unrealistic to try to use the social security system alone to provide an adequate living for all of our elderly citizens. We can and should meet the needs of our indigent aged through a generous but separate Federal program.

The social security system today lies in grave danger of degenerating into an undignified form of Federal dole. But, if Congress will act with courage to preserve the original concept of the system, endless generations can continue to accept their checks with the satisfaction and self-respect that go with an earned retirement.

INCOME TAX INDUCEMENTS FOR PERSONAL RETIREMENT SAVING

BY ROBERT N. SCHOEPLEIN*

The present schedule of retirement benefits under social security (OASDHI) again is being criticized as "inadequate." This has a familiar ring; the elderly experience recurring purchasing power gaps as labor force earnings and consumer prices rise. The Federal Government has four broad courses of action in upgrading the guaranteed maintenance income for the aged: (1) Increase the benefit schedule under OASDHI; (2) adopt and expand complementary public assistance programs; (3) introduce a new income transfer program, such as a negative income tax; (4) provide inducements—usually through tax incentives—to accelerate the rate of private retirement saving.

This paper [1] focuses on the issue whether income tax inducements can significantly increase the rate of personal retirement saving. A particular form of incentive has received recent attention. The basic proposal is to create a special Federal income tax deduction for current personal retirement saving (including current employer pension contributions in some variants of the proposal).[2] Some 6.5 million or so self-employed taxpayers presently are eligible for such a "personal pension" deduction under the individual income tax, but these self-employed represent only about 10 percent of all taxpayers under age 65.[3] The Canadians have such a deduction in their national income tax, and eligibility is extended to virtually all taxpayers.[4] These United States and Canadian programs may have been adopted with several objectives in mind, including equity considerations. If these tax-incentive schemes are to complement social security, however, the relevant performance test is the consequent increase in the rate of personal saving.

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*University of Connecticut.

[1] I am indebted to Charles M. Tiebout and Gardner M. Brown, Jr., for their comments in reviewing a draft of this paper, though I am responsible for errors that may remain. The Institute for Economic Research, University of Washington, provided financial support for computer research.

[2] Cf. U.S. President's Committee on Corporate Pension Funds and other Private Retirement and Welfare Programs. Public Policy and Private Pension Programs, Washington, 1965. U.S. Congress, Joint Economic Committee. Hearings: "Private Pension Plans." 89th Cong., 2d sess., spring 1966.

This special income tax deduction to induce personal retirement saving should not be confused with the proposal to permit income-tax deductions of employee OASDHI contributions, discussed in U.S. Congress. House, Committee on Ways and Means. Hearings on President's proposals for revision in the social security system, 90th Cong., 1st sess., Mar. 1–3, 1967, pt. I, pp. 195–201.

[3] The program is titled the "Self-Employed Individuals Tax Retirement Act of 1962" (76 Stat. 809), and frequently is cited as "H.R. 10" in trade journals. The eligibility estimate is based on U.S. Treasury "Statistics of Income, Business Tax Returns, 1962," adjusted to 1964 preliminary returns. The total represents the sum of partners in partnerships with net profit plus sole proprietors with net profit.

[4] Registered retirement savings plan. Stat. Can. 1957, 168.c.29.

Few eligible taxpayers presently are utilizing the "personal pension" deductions in either the United States or the Canadian programs—about 1 percent and 2 percent of those eligible, respectively. The evaluation in this paper indicates that taxpayers indeed may be wise in ignoring this particular tax incentive scheme. In short, the attraction of this program in inducing incremental personal saving may be overrated. The income tax advantages in participation superficially may appear attractive, but a closer examination shows that the relative dollars-and-cents advantages in fact may be quite nominal. Moreover, these "personal pension" programs have severe constraints on liquidity and on forms of investment, and these restrictions must be weighed against any supposed increase in investment yields because of preferential income tax treatment.

A. The Universal Personal-Pension Deduction: Relative Net Yield Advantages in Participation

The present individual income tax does tend to discourage personal saving for future needs—by the compound effect of permitting current deductions on borrowing charges, coupled with the taxation of interest earnings on savings.[5] This announcement effect can be mitigated by permitting special income tax treatment of selected transactions, thereby increasing their net (aftertax) yields on taxpayer investment. This difference in net yields is the stimulus for increased personal saving. Response will depend on the interest elasticity of personal saving to changes in net yields, and, of course, the magnitude of change in yield.

Given the mechanics of alternative income tax treatment, one can compare the relative net yield advantages of two or more taxpayer alternatives. Some abstractions are in order, however, to provide a consistent basis for comparison. Assume initially that a taxpayer is restricted in investment to a specific corporate bond, but has income tax alternatives in purchasing and realizing income from these bonds. The gross (before tax) yields, risk, and liquidity aspects of the tax options are equal, but alternative tax treatment may affect net (aftertax) yields.

Assume further—for comparative purposes—that the taxpayer withholds a specified sum from gross income, for retirement saving purposes.[6] This is not to suggest that the individual in question is a "target" saver, because we in fact are interested in changes in the rate of personal saving as a consequence of the income tax incentive. Rather, this model illustrates the relative change in net yields, as the basis for taxpayer response.

The taxpayer's savings would be subject to "standard" tax treatment if he had no tax options. This approach (designated option A) may be termed the "no tax break" situation. The individual has set aside a certain sum from gross income, but current income taxes first must

[5] Alan Williams, Public Finance and Budgetary Policy, (New York, 1963), pp. 62–65.

[6] One alternatively can structure the argument with retirement saving as a function of disposable income. The advantage of tax deductibility can be illustrated as an addition to the initial investment; e.g., $Rs\ (1+\frac{r}{1-r})=R$, where Rs=desired savings from disposable income, and R is the actual increased basis for investment because of the current deduction.

be paid on this saving. The net (aftertax) basis for investment does generate annual income, but these realized gross yields are immediately subject to tax under the "standard" tax approach. The individual does have a final fund at age 65 after all this income taxation, and no further income tax is levied on this accumulated net wealth at time of withdrawal.

To illustrate, assume that our individual intends to save $400 from gross income. Income taxes first must be paid, and $260 will remain as the basis for retirement saving if our taxpayer faces a 30-percent marginal tax rate. The taxpayer invests in 6-percent corporate bonds, subject to an annual levy on current earnings of the same 30-percent marginal tax rate. If our saver presently is 35 years old, his final fund at age 65 from this single contribution will be $962. In order to compare alternative tax effects, we must relate this final fund to the initial gross saving of $400. Our individual finds that because of income taxes his effective net (aftertax) yield is 2.97 percent of his initial $400.

Now, assume that the individual income tax is amended to permit an alternative tax treatment (designated option B) of personal saving. This alternative summarizes the essential features of the "personal-pension" deduction both under the U.S. Self-Employed Individuals Tax Retirement Act and the universal Canadian personal saving program. First, the individual can deduct his allowable personal-pension saving from current taxable income, thereby avoiding any present tax liability. Second, earnings on investment are subject to tax liability only at ultimate withdrawal. Taxes also are levied on the original principal on withdrawal.

Our figurative saver now can invest his entire $400 in the same 6-percent corporate bonds. He will find at the end of 30 years that his gross final fund has grown to $2,297. Our individual now must include these moneys in reportable income at time of withdrawal. Assume that the entire final fund is withdrawn at age 65, and that the individual's marginal tax rate is 18 percent. This reduced marginal tax rate reflects the pensioner situation of lower total reportable income in retirement years. For his efforts, the taxpayer now has his $1,884 net purchasing power at withdrawal. This represents an effective net (aftertax) yield of 5.30 percent on the original $400 of gross intended saving.

One compares the net—after all taxes—final retirement moneys, illustrating the differential effect of alternative tax treatment.

R = Dollars of retirement saving from gross income ($400).
r = Marginal tax rate during contribution year (0.30).
i = Nominal annual gross yield on investment (0.06).
q = Marginal tax rate on investment annual gross yield (0.30).
t = Marginal tax rate at time of withdrawal (0.18).
m = Number of years between contribution and withdrawal (0.30).

Standard option A: $[(1-r)R]\,[1+i(1-q)]^m$ A = net final fund.
Deduction option B: $(1-t)R(1+i)^m$ B = net final fund.

$$Z=\frac{B}{A}=\frac{(1-t)\ (1+i)^m}{(1-r)\ [1+i(1-q)]^m}=\left(\frac{1-t}{1-r}\right)\left[\frac{1+i}{1+i(1-q)}\right]^m$$

The effect of changes in each parameter on Z can be noted.[7] The relative advantage of a "personal-pension" deduction becomes more attractive as the ratio of current-year marginal tax rate to expected withdrawal-year marginal tax rate (i.e., r/t) increases.[8] Note that tax option B still will give a greater net final fund even when the respective rates are equal ($r=t$), because of the tax shelter.[9]

The net yield advantage of the personal pension deduction can be quite attractive to a taxpayer with a high current marginal tax rate, if this were the only preferential tax treatment option. This can be illustrated for arbitrary values $q=0.3$ and $i=0.06$.

The essential point is that a taxpayer is not restricted to these two income-tax alternatives; there are other attractive options to increase net (aftertax) yields. Capital gains is a familiar alternative. In capital gains as in the standard approach, an individual establishing a retirement-saving fund first must pay income taxes on current earnings before investment. If the interim earnings on principal are not "realized" for tax purposes until retirement, these sheltered earnings will be subject to a capital gains marginal tax rate, assumed to be $0.5t$ at withdrawal.[10]

Using the same illustrative parameters as in the first two tax options, our taxpayer will realize a $1,409 net final fund, or an effective net (aftertax) yield of 4.29 percent. The net final fund under capital gains option C is calculated as the original net investment and accumulated earnings, minus the capital gains marginal tax rate on earnings at the time of ultimate withdrawal.

$$C=R(1-r)\ (1+i)^m-\frac{t}{2}[R(1-r)\ (1+i)^m-R(1-r)]$$

$$=R(1-r)\ (1+i)^m\left(1-\frac{t}{2}\right)+\frac{t}{2}R(1-r)$$

$$Z'=\frac{B}{C}=\left[\frac{1-t}{1-r}\right]\left\{\frac{1}{1-\frac{t}{2}\left[1+\frac{1}{(1+i)^m}\right]}\right\}.$$

The "personal pension" deduction (option B) now is compared with other available tax options (e.g., capital gains option C). The relative effective net yield advantage of the "personal pension" deduction is reduced by over 40 percent in the illustrative example. However, one cannot state categorically that the relative effective net yield

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[7] $\frac{dZ}{di}>0$, $\frac{dZ}{dm}>0$, $\frac{dZ}{dq}\,dq<0$; $0\leq i, q, r, t\leq 1$,

[8] Specific values of the marginal tax rates also are significant in addition to the absolute differences. Thus the advantage is greater when $(t, r)=(0.2, 0.5)$ than when $(t, r)=(0.1, 0.4)$. The advantages of preferential tax treatment is a function of the level of potential tax liabilities.

[9] Assume $q=0.3$, $i=0.06$. If marginal tax rates in the contribution year and payoff year are equal, the payoff advantage of B over A is

M Earning years	$Z=\frac{B}{A}$
10	1.18
20	1.40
30	1166

[10] This is an oversimplification of capital gains rates, but will serve for illustration.

advantage will be reduced ($Z' < Z$), because of the number of parameters involved.[11] The attractiveness of the tax shelter in the "personal pension" deduction, though, is significantly reduced.

Taxpayers have other preferential tax treatment options in addition to this orthodox capital gains approach. The "personal pension" deduction should be compared with the next most attractive tax option to illustrate the relative net yield advantage, if any, of the deduction program. A comparison limited to the "personal pension" deduction versus the standard "no-tax-break," tax treatment (B/A) certainly gives a distorted view of the relative attractiveness of the proposed pension scheme.

B. Investment and Liquidity Considerations

All aspects of investment other than the tax treatment of gross yields were assumed equal in comparing the yield advantages of tax options. In other words, the taxpayer was assumed to have complete freedom in his choice of investment. The preferential income tax options, then, would affect only net (after tax) yields.

In reality, preferential tax treatment may be combined with one or more investment constraints. These restrictions will reflect the intended policy objectives of the program. A principal object of both the current U.S. self-employed deduction and the Canadian universal pension deduction is to promote retirement saving—not speculative investment. Restrictions limiting the nature of investment and constraints against premature withdrawal before retirement, therefore, are consistent with the above goal. However, one must weigh these adverse features against any net yield advantage, if these constraints are unique to the "personal pension" deduction.

Both the U.S. and Canadian deductions prohibit "speculative" or personal business investment, to minimize the risk of principal. This restriction may be reasonable, but it imposes a risk-component stereotype on alternative forms of investment. Taxpayers may have "unapproved" investment opportunities generating greater gross yields (discounted for risk premiums) than permitted investment. Our illustrative taxpayer may have an opportunity to invest in real estate with an expected effective net yield of 6.50 percent under capital gains, instead of the 5.30 percent effective yield from corporate bonds under the "personal pension" deduction. The capital gains option presently is available to the taxpayer; if he chooses this route, the "personal pension" deduction will not have increased the rate of personal savings.

Moreover, independent businessmen and farmers by nature may be risk takers, and, therefore, may choose to gamble on business expansion even if one could demonstrate that expected returns from the alternative "personal pension" deduction were greater. But, the important consideration again is that nonpermitted forms of investment may

[11] $Z' < Z$ if $1-\frac{t}{2}\left[1+\frac{1}{(1+i)^m}\right] > \left[1-\frac{ig}{1+i}\right]^m$.

qualify for alternative unique preferential tax treatment. The "personal pension" deduction is but one option in the special subset of opportunities to minimize income taxes.

In addition to restraints on forms of investment, "personal pension" deductions generally severely limit or outright prohibit the withdrawal of funds before some specified retirement age. This is an undesirable feature from the saver's point of view, as retirement funds normally would provide a concurrent contingency fund.

Younger participants in the "personal pension" program are faced with a longer period of locked-in funds, yet there is no compensating adjustment in the tax inducement mechanism to reflect this variable feature. Consequently, one may postulate that participation in such a program—ceteris paribus—is directly related to the age of the taxpayer; that is, inversely related to the number of illiquidity years between contribution and retirement age. An analysis of Canadian participation, summarized in an appendix, does not reject this hypothesis.[12] The tests indicate that personal pension contributions are significantly related to the age of the taxpayer.[13] Individuals initiating a retirement program late in life will have few remaining years to accumulate an adequate fund to supplement social security.[14]

As a final note, preliminary analysis of Canadian participation data indicates that individuals covered by company contributory pensions will reduce "personal pension" contributions accordingly, and to some degree the two programs are substitutes.[15] If this observation is valid, an expansion of the contributory pension movement will offset some increases in personal saving attributable to the "personal pension" deduction (at least among employees eligible for both programs).

The introduction of new income tax inducements, then, may not significantly increase the rate of personal retirement saving. Certainly this is the experience of the "personal pension" deduction instituted on a limited basis in the United States and as a universal taxpayer deduction in Canada. An appreciation of the true relative net yield advantages to participation, coupled with investment and liquidity constraints, may explain this small taxpayer response. Individuals generally have existing alternatives that discount the superficial attractiveness of the "personal pension" deduction.

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[12] The U.S. individual income-tax returns do not record the age of the taxpayers, but Canadians are requested to report their birth year on their respective returns. I gratefully acknowledge the interest and cooperation of the Canadian Department of National Revenue (Taxation Division) in providing detailed information on taxpayer participation, subject to departmental policies regarding the disclosure of the taxpayer's identity.

[13] The age distribution of the Canadian labor force is skewed to the younger workers, and this bias tends to reinforce the above participation date. Canada, "Census of Canada, 1961, Labour Force: Employment Status by Age and Sex" (catalog 94–502), Bulletin 3.1/2, Mar. 31, 1964.

[14] I assume in this paper that the intent of a "personal pension" deduction is to increase the rate of personal saving. While propensities to save may be relatively constant over time, motives for saving may vary through the life cycle. Retirement saving, therefore, may be an increasing function of age, regardless of the "personal pension" deduction. If this program is to be successful, however, the effect of the deduction presumably will be to increase the rate of retirement saving at all age levels. The negligible rate of participation in the Canadian program by taxpayers under age 40 (adjusted for income) tends to support the illiquidity hypothesis—that there is more to this program than increases in net (after-tax) yields.

[15] The subsample of taxpayers studied declared company pension and personal pension contributions significantly under any statutory ceilings, and therefore were free to add to the amount of "personal pension" contribution at their discretion.

APPENDIX: STATISTICAL ANALYSIS

This is an analysis of the relation between taxpayer age and income tax deductions for personal-pension contributions under the Canada Registered Retirement Saving Plan, 1964. All tests are significant at the 1 percent level. Dollar Registered Retirement Saving Contributions (S) is related to taxpayer assessable (adjusted gross) income (Y); Taxpayer age (A):

(a) Total all participants: 90,585.
Random sample size: 22,258 records.

$$S = a_o + b_1 Y + b_2 A$$
$$= -31.29 + 0.05Y + 1.10A$$
$$(0.0004) \quad (0.22).$$

Mult. corr. coefficient 0.667; F value, 3895.

(b) Total Employee Participants: 58,481.
Random sample: 7,934 records.

$$S = 128.08 + 0.05Y + 2.78A$$
$$(0.0006) \quad (0.56).$$

Mult. corr. coefficient, 0.654; F value, 2967.

(c) Total Self-Employed Professional (Occupation) Participants: 1964: Random Sample: 10,409 records.

$$S = 39.35 = 0.04Y = 0.51\text{A}$$
$$(0.0005) \quad (0.09).$$

Mult. corr. coefficient, 0.614; F value 3142.

OLD-AGE INCOME ASSURANCE BY LIFETIME INCOME SPREADING WITH DEFERRED TAXATION AS THE NATURAL TREATMENT

BY RAY M. PETERSON, F.S.A.

CONTENTS

I. INTRODUCTION

In December 1956 the Business Committee on National Policy of the National Planning Association stated, in connection with a staff survey of private pension plans:

> The task of adequately exploring the complex and difficult issues of national policy involved in the broader and longer term economic and social consequences of the growth of private pension funds requires resources and access to information greater than those normally possessed by private research organizations. Hence, the NPA Business Committee urges a congressional committee—perhaps the Joint Economic Committee—to undertake such a detailed and comprehensive review in the near future.*

*Also, note 1952 study prepared for Joint Committee on the Economic Report entitled *Pensions in the United States*, under direction of Robert M. Ball, now Commissioner of Social Security.

It is gratifying now to have the Joint Economic Committee, however belatedly, take up this challenge.

Noting that practically all of the individual contributors to this symposium come from the halls of académie, this writer, a nonacademic, feels intellectually complimented to find himself amidst this school of scholars. Without presuming to explain the composition of this group, one may observe that academics are believed, correctly or not, to have more leisure for theoretical meditation than nonacademics and, indeed, may be expected to "publish or else." This then leads to the query—Is there risk that their contributions will be considered as the theory of a leisure class composed during the leisure of a theory class? In view of the great practical importance of the issues being explored, it is earnestly hoped that the several contributions will not prove to be merely theoretical exercises but will be sources of added insights that aid materially in identifying practical solutions and answers within a framework of a developing economy that is responsive to the uniquely American ideals and objectives of a viable free enterprise system that is also motivated by a recognition of social responsibility. This writer certainly hopes his contribution will serve such practical ends.

In this paper, the term "private pension plans" refers to "qualified" pension and profit-sharing plans covering workers in the private sector and the term "employer-instituted pension plans" refers to the aggregate of such private pension plans and plans covering employees of Federal, State, and local governments.

The 1967 report of the Joint Economic Committee includes the following provocative statement regarding income maintenance:

> Transfers of money from higher income families to lower income families and from those with current earning power to those whose earning power is limited through no fault of their own is fast approaching one-tenth of the total of the Nation's output per year. These programs are predominantly public, but there are, in addition, many private programs, most of which enjoy substantial tax benefits to assist them.
>
> In recent years, many questions have been raised about this system of income maintenance, with many contending that the system is ill coordinated, capricious in its effects, inefficient, costly to administer, arbitrary in its standards for deciding who is to benefit, and, in general, interferes with efficient resource allocation, and hence reduces overall efficiency of our economy.
>
> The committee hopes that the study now in progress by our Subcommittee on Fiscal Policy will result in a new set of standards or criteria for judging measures for income maintenance that will be more equitable, efficient, coordinated, and flexible than the present morass of inadequate and often irrelevant programs.

Although this statement may be considered a premature and unduly harsh prejudgment of the nature of existing old-age income programs "before all the returns are in," including the contributions of the current symposium, it does express, as abstractions, desirable objectives

in its plea for programs that are "equitable, efficient, coordinated, and flexible." A more thorough examination and better understanding may well reveal that present programs now have many equitable attributes, an efficient allocation of accumulated invested funds, a purpose to achieve a fair coordination with OASDI benefits, and a highly desirable range of flexibility in designing plan features. As to the alleged "morass * * * of programs" and noting that "morass" is defined in Webster's Seventh New Collegiate Dictionary as "something that traps, confuses, and impedes," it may be found that some of the traps and impediments are rooted in tax laws and regulations and that the confusion may arise, in part, from incomplete study and faulty understanding.

This paper aims to serve some of the objectives expressed by the foregoing statement of the Joint Economic Committee by identifying and examining an equitable and uniform principle of deferred income tax treatment of provisions for old-age income that facilitates lifetime income spreading for all persons as the natural method of tax treatment.

II. Lifetime Income Spreading

PRELIMINARY OBSERVATIONS

The principle of taxing personal income on an averaging basis is now found in our tax laws in a limited form. Social scientists tell us that we should expect a continuing decrease in working-life expectancy and an associated pronounced increase in the number of nonworking years of so-called old age. In view of this prospect, we need to recognize the importance of the application of the income spreading principle on a lifetime basis with particular reference to provisions for old-age income assurance. This principle may be expressed simply and briefly as tax-free input and taxable output. The writer, in 1959, described this principle as the "payout principle" in these words:

> In its purest form * * * may be expressed as follows: Contributions and investment return thereon which are irrevocably devoted to the provision of retirement life income are free of income tax when made or earned but the entire retirement income is included in taxable income when received * * *. The payout principle is sound for two fundamental reasons: (i) the encouragement of savings accumulations for retirement purposes constitutes a strong force working to provide additional capital from which, in turn, may be gained the increase in productivity needed in a nation's economy to provide the desired retirement benefits; (ii) it is fair and reasonable that an individual's income should be spread and acknowledged as realized over the entire period of life and not limited to the active earnings years. It is proper that an individual pay an income tax only when income is in hand and available for living costs.
>
> It is important to distinguish between forms of savings which a person may use freely in a manner and at a time of his choosing, and a form of savings devoted irrevocably to retirement benefits. In order to avoid objectionable and unfair

> discrimination, the payout principle should apply only to retirement program where the benefit of accumulations can be taken only as a life income after retirement or is subject to tax penalties if taken in any other form. A "locked-in" status should exist.[1]

For purposes of this discussion, the underlying theme of lifetime income spreading is that, by appropriate tax treatment, all persons, through individual, group, or institutional programs, public and private, may spread the labor rewards of working years over their entire lifetime, including the nonearning years of retirement, and pay an income tax only as such income and accumulated investment returns thereon are, in fact, received. No distinction should be made as to the source of the contributions—that is, whether from the individual or his employer.

The following statements from the Joint Economic Committee print, "Old Age Income Assurance: An Outline of Issues and Alternatives," relate to this discussion:

> The tax treatment accorded both retirement income and saving for retirement has the double objective of encouraging taxpayers to practice lifetime consumption averaging and of enabling aged taxpayers to maintain a higher level of consumption with a given income than they could otherwise. (P. 6.)
>
> Categorical taxation, like categorical public assistance, is faulty in principle. (P. 31.)

At present, there is categorical application of this principle, and consequent discrimination, since it exists only with respect to employer contributions under employer-instituted pension plans and contributions made under the Self-Employed Individuals Tax Retirement Act. Three major areas require attention; namely, (1) employee contributions under employer-instituted plans, (2) retirement contributions by working individuals who are not covered by such plans and investment accumulations thereon, and (3) benefits and employee tax contributions under the OASDI system.

Although the OASDHI system is financed on a different basis than funded employer-instituted pension plans, the application of the lifetime income spreading principle to such system has validity from the viewpoint of the individual worker who contributes to the system during his working years in order to enjoy benefits during his nonworking years.

The general acceptability of this principle is demonstrated by the fact that its application is worldwide in many different economic environments. For contributory private pension plans, employee contributions are tax deductible, in full or with limits, in Canada, Belgium, France, Germany, the Netherlands, and the United Kingdom.[2] For national compulsory, old-age pensions, employee contributions are tax deductible and benefits are taxable in Austria, Belgium, Can-

[1] "The Payout Principle of Taxation for Retirement Income Programs Should Be Applied Without Discrimination," Journal of the American Society of Chartered Life Underwriters, spring, 1959. Ray M. Peterson.

[2] John K. Dyer, unpublished report of September 1966.

ada, Denmark, Finland, France, Germany, Ireland, Japan, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland, and the United Kingdom.[3]

TAX-DEDUCTIBLE EMPLOYEE CONTRIBUTIONS UNDER EMPLOYER-INSTITUTED PENSION PLANS

As a measure that is an affirmative response to the current and laudable interest by government officials and others in improving the performance of private pension plans, employee contributions under qualified plans should be tax deductible provided they are "locked in"; i.e., nonwithdrawable or withdrawable only with a tax penalty. Such a measure would have several distinct advantages:

(i) Discrimination against employee contributions, vis-a-vis employer contributions, would be removed;

(ii) The present discouragement of contributory plans would be discontinued;

(iii) The prospect of greater benefits would be enhanced since the level of benefits for contributory plans is generally higher than that for noncontributory plans as indicated by the report of McKinsey & Co.;[4]

(iv) Contributing employees would have identifiable and fully vested equities that are in terms of dollars and that would be properly considered by employees as their personal savings for retirement purposes;

(v) Vested benefits, derived from employer contributions, now frequently lost by withdrawal of employee contributions upon employment termination, would be preserved;

(vi) The income spreading operation would be completed since investment earnings on employee contributions under employer-instituted pension plans are now free of tax until the employee receives a benefit;

(vii) Since the contribution input of private pension plans would be treated uniformly, then, for the purpose of developing appropriate rules for integrating private plan benefits with OASDI benefits to meet the nondiscrimination requirements of the law, the question, artificial in many circumstances, of just who was paying the cost or bearing the burden is not so evident a consideration.

TAX-DEDUCTIBLE CONTRIBUTIONS FOR NONCOVERED PERSONS

Persons not covered by employer-instituted pension plans or not eligible for SEITRA plans should have the opportunity to set aside tax-deductible contributions from earned income for retirement purposes on a basis that assures dedication to such purposes. Funding arrangements should include the use of the facilities of banks, trust companies, life insurance companies, mutual funds, special Government bonds, etc. Statutory limits should be fixed and appropriately adjusted to recognize any contributions or benefits under employer-instituted pension plans. In Canada, section 79B of the Income Tax

[3] Social Security Bulletin, August 1966, p. 11.
[4] Corporate Retirement Program, McKinsey & Co., Inc., 1965.

Act authorizes registered retirement savings plans for individuals under which annual contributions of 20 percent of earnings, subject to a maximum of $2,500 a year, may be made. Adjustments are made for contributions to employer-sponsored pension plans.

Support of the two foregoing recommendations as well as extension of the opportunity for deferred taxation of provisions for retirement for the self-employed, as enacted by SEITRA, was ably made in 1943 by an eminent legal scholar, Dean Erwin N. Griswold of the Harvard University Law School. Reference to Dean Griswold's views was made in a scholarly work published in 1949 by the Industrial Relations Counselors, Inc., entitled "Impact of Taxes on Industrial Pension Plans," written by Rainard B. Robbins. A paper by Dean Griswold entitled "The Tax Treatment of Employees' Contributions to Pension Plans," published in the Harvard Law Review of December 1943, was cited by Robbins and referred to as follows:

> Dean Griswold presented a very thoughtful note on this subject in the *Harvard Law Review* in which he takes the broad point of view that it may be unwise "to tax the employee currently on what is actually so remote, though important, a benefit." He points out that from the employee's standpoint a pension is income when he receives it and that *his earnings during productive years must for practical purposes be spread over his whole remaining life:* "What he receives after his retirement is in reality his income then, for then is when it comes in to him. To tax him on it at the top bracket of the graduated rates of his earnings is an unfair failure to recognize the economic facts." Griswold contends that there is no substantial reason for distinguishing taxwise between employer and employee contributions and that "in both cases, the employee's current productive capacity is being utilized to make provision for his retirement." Suggesting safeguards to assure that such payments are dedicated to retirement income and cannot be used otherwise, Griswold states firmly his conviction that taxing statutes should be expressly aimed to give employee contributions the same tax treatment as employer contributions. He goes further and suggests inclusion of the self-employed. In part he writes:
>
> "As long as the plan is really a pension plan, the reasons which have already led to the conclusion that the employer's payment in such case should not be taxable to the employee until the employee actually receives it, should lead to the same conclusion with respect to the similar payments which are withheld from the employee's wages, either under State or Federal law or under the terms of the employment contract. To achieve this result, the tax statutes should be expressly amended so as to provide that amounts paid by an employee to provide bona fide pension benefits after his retirement should be deductible from his current income * * * With such limitations, provision could also be made for deduction of pension payments made by the self-employed, or by employees whose employers do not provide a pension plan." [Emphasis added.]

OASDI BENEFITS AND EMPLOYEE TAX CONTRIBUTIONS

Social security benefits are not includable in taxable income on the basis of an administrative ruling of the Internal Revenue authorities. Appendix I hereof presents some views and discussion regarding the origin of this ruling. It appears that there is a difference of opinion between a member of the Committee on Ways and Means and a Treasury official and even differences of opinion within the Treasury Department. There is agreement that the Congress, by appropriate legislation, could make social security benefits includable in taxable income.

The application of the lifetime income spreading principle to the OASDI system would call for the tax deductibility of employee tax contributions along with the inclusion of benefits in taxable income. If the occasion arises when serious consideration is being given by the Congress to general revenue support for the OASDI system, such tax treatment, aside from its own real merits, deserves first consideration as an appropriate liberalization that is a strain on general revenues but is more logical than direct general revenue support.

If this change in the tax treatment of OASDI benefits and employee tax contributions were made at a time of a modest increase in gross tax contributions and a general increase in benefits, employee net tax contributions could remain substantially unchanged and the increase in benefits would make the taxation of benefits more acceptable (or less unacceptable) to those who have been receiving tax-free benefits. For example, if an added 0.6 percent of taxable payrolls for employees and for employers were made effective, an additional $3.5 billion to $4 billion would be available for increased benefits—about a 15-percent increase. About $1.75 billion to $2 billion would come from employers which would be tax deductible, employees' net tax contributions would be a little less than presently scheduled and net contributions from general revenues of $2 billion to $3 billion would result after taking account of added revenue from taxable benefits and the effects of the slightly lower net employee tax contributions.

Under this proposal, the employee should have a specific deduction of the amount of tax contribution similar to regular exemptions; for example, the deduction would appear as an additional $150 to $400 deductive amount, depending upon gross earnings rate and the higher social security tax rates adopted. For persons who have no taxable income from which to deduct the social security tax contribution, an actual tax credit should be provided based on the initial marginal tax rate, now 14 percent. When a taxpayer must identify in his tax return the exact amount of social security tax contribution in order to get the deduction, he will be much more aware of its magnitude than under the present automatic payroll deduction practice. A real cost consciousness results. This tax-deductible arrangement is more favorable, of course, at the higher levels of earnings than at the lower levels because of the progressive income tax rates. Those in the higher income brackets, however, would be those persons, generally, who would, in fact, pay a tax on their social security benefits when received, thus producing a substantial order of equity.

The inclusion of OASDI benefits in taxable income would raise two questions: (1) The need for recognition of past social security tax contributions paid out of taxable income, and (2) the possible (perhaps, undoubted) vigorous dissatisfaction with the taxation of a benefit that has been received for some time on a tax-free basis. As to the first question, we should observe that, as indicated by actuarial note No. 20, June 1965, of the Social Security Administration, the employee tax contributions (without interest) for those going on old-age benefits in very recent years have been, for random samples, no more than 6 percent of the prospective benefit payments. Hence, a reasonable order of equity would be achieved by, say, including benefits in taxable income only after they have been in receipt for 1 year. The vast majority of present recipients would already have received tax-free benefits in excess of their tax contributions paid from taxable income. As to the second question, an increase in benefits, as indicated above, would generally serve as an offset to the effect of inclusion of benefits in taxable income, except, perhaps, for those in the higher income brackets who would have no legitimate cause for complaint in view of the undeserved tax bargain they have been enjoying.

SPREADING OF INCOME FROM SECOND CAREERS

The income spreading considered in the foregoing discussion has related generally to spreading the income of pre-age 65 years to the post-age 65 years. There is need, however, for positive encouragement of productive employment after age 65 and also for the opportunity for persons who have reached age 65 and desire to embark on second careers, to spread earned income into later years to level out income and to serve as an offset to the erosion of inflation. The following proposal, which the writer has not seen proposed before, deserves serious consideration as a means of implementing these objectives:

On the basis of the principles of the Self-Employed Individuals Tax Retirement Act, permit a person over age 65 to defer income tax on a substantial part of earned income plus an amount equal to, say, 20 percent of retirement income derived from employment prior to age 65. (If social security benefits should become includable in taxable income, 100 percent of such benefits, not denied by the retirement test, should be available for tax deferment.) Taxation of investment income with respect to such amounts would also be deferred as under SEITRA. An irrevocable election to defer income a specified period of years should be required, say 5 or 10 years. Income tax (or estate tax) would eventually be paid on such deferred income and investment earnings thereon.

LUMP-SUM SETTLEMENTS AT RETIREMENT

The present law permits lump-sum settlements in lieu of a lifetime retirement income. Such a settlement is taxed as a long-term capital gain under employer-employee plans provided, generally, that 100 percent of the pension value is taken. So far as serving the end of providing old-age life income, the law is deficient on two counts: First, it is wasteful in that it virtually compels the cancellation of all re-

tirement income values in order to enjoy the capital gains tax treatment; second, it fails to provide assurance that pension contributions, or a major part thereof, are irrevocably dedicated to providing old-age life income. In order to improve this situation, serious consideration should be given to adopting a tax treatment and limitations similar to those in Canada and the United Kingdom where no more than 25 percent of pension values may be taken as a lump sum. Although such lump sum is tax free in these countries, it would be fair to apply the tax treatment that now is in effect in the United States for SEITRA plans.

III. The Naturalness of the Federal Income Tax Treatment of Employer-Instituted Pension Plans

PRELIMINARY OBSERVATIONS

In 1965, $14.26[5] billion was contributed to employer-instituted pension plans, $7.82 billion under private qualified plans and $6.44 billion under plans covering Federal, State, and local government employees. As estimated by the writer, the part of those contributions made on a collective basis; i.e., contributed with respect to the entire group of employees and not with respect to the individual in the form of employee contributions or by the purchase of annuities, was $6.2 billion for private qualified plans and $3.6 billion for Federal, State, and local government plans. Thus, nearly 70 percent of total contributions for employer-instituted plans were on a collective basis. The deferred tax treatment (i.e., only taxing benefits as received) of employer contributions and investment earnings with respect to both employer and employee contributions applies to all these plans. The collective nature of nearly $10 billion of contributions for employer-instituted plans is an important fact to recognize in appraising the Federal income tax treatment of these plans. (Under the railroad retirement plan, not included above, there is a completely free Federal income tax ride, except for nondeductible employee contributions, since employer contributions and investment earnings produce no taxable income for the employee and benefits are exempt by law from Federal income tax. Total contributions in 1965 amounted to $0.63 billion, one-half paid by the railroads on a collective basis.)

Contributions made on a collective basis are commonly determined by actuarial assumptions that can include rates of mortality, disability, withdrawal, salary progression and retirement. It is evident that under such an "averaging" process, there is no precisely determinable part of the contributions that can be said to have been made, in fact, for or on behalf of a particular individual. Similarly, it would be impossible to allocate to an individual employee, on a fair and accurate basis, a part of current investment earnings of a pension fund. The difficulty of allocating employer contributions and investment income to specific employees was recognized by the 1967 Royal Commission on Taxation of Canada in these words: " * * * such an allocation (of

[5] "Private and Public Pension Plans in the United States," 2d edition, March 1967, Institute of Life Insurance.

employer contributions) would in many cases be difficult if not impossible" (p. 431) and "in many cases it would be very difficult to allocate the employer's contributions or the property income to the beneficiaries." (p. 435). Yet, U.S. Government officials, in seeking to demonstrate the benefit of deferred taxation to employees, start with the premise that such allocations could be made. Appearing before the Subcommittee on Fiscal Policy in May 1966, Assistant Secretary of the Treasury Stanley S. Surrey, in the following words, spoke of "deferring" an employee's "tax liability" thus clearly implying that a current tax liability did exist initially but was deferred by specific provisions of the law:

> A pension or profit-sharing plan is a part of the employment contract. Often the plan terms are negotiated in collective bargaining. Whether or not negotiated, they clearly affect the wage rate. From the employer's standpoint, this is part of the labor cost. From the standpoint of the employee, pension or profit-sharing benefits are an element in comparing total compensation between different employments.
>
> The development of pension and profit-sharing plans has without question been aided by favorable tax treatment, which has the *effect of lowering the tax liability* when compensation is paid in this manner. The tax advantage given to these plans is the basis of the provisions in present law imposing certain qualifying conditions on a pension or profit-sharing plan. Since the provisions applicable to pension and profit-sharing plans are substantially similar, I shall simply refer to pension plans.
>
> * * * Under qualified employer-financed plans, the employees are not currently taxable either on the amounts contributed by employers to the plans or on the investment income of the pension fund. The *employee's tax liability* for these amounts *is deferred* until he retires and receives benefits from the plan, at which time his effective tax rates are apt to be lower.
>
> * * * Since the employer's contributions and investment income are not taxable as current income to the employee under qualified plans, even where the pension rights are vested, tax deferment represents tax savings to employees. It creates opportunities to obtain more liberal pensions than if the employee received *equivalent wages in lieu of contributions and had to finance their own pensions.*[6] [Emphasis added.]

Mr. Surrey's argument rests on an unreal assumption that, under private plans as they, in fact, exist today, it is feasible and possible to identify an "equivalent wage." If Mr. Surrey's approach is valid for private qualified plans, it is equally valid for the plans covering Federal, State, and local government employees. The members of the civil service retirement plan "enjoy" the same kind of alleged deferment of tax liability as he attributes to persons covered by private

[6] "Private Pension Plans," hearings before Subcommittee on Fiscal Policy of the Joint Economic Committee, May 1966, pp. 412–413.

qualified plans, such "privilege," so he says, provided by special tax provisions for such plans. But, the tax deferment for Federal employees must arise from some "divine right" since no specific "favorable" tax legislation exists. If it is appropriate to impute an equivalent wage to collectively made employer private plan contributions, with all its obscurity, it would be equally appropriate to impute such value to the economic current accrual value of civil service pensions, whether the Government puts up the money or not. The same point applies to the current accrual value of the unfunded benefits of the military service retirement system which may be in the neighborhood, on the average, of 30 percent of payroll. Dr. Roger Murray made this point effectively in a talk on February 9, 1967, before the American Pension Conference. He said:

> I should remind Dr. McClung that the tax advantages to the generals and admirals of not taxing their accruing benefits as additional income is just as real as when employer contributions to pension plans are not recognized when made on behalf of Governors, Congressmen, and business executives.

THEORETICAL MATHEMATICAL CONSIDERATIONS

There is need to recognize that pension benefits provided under employer-instituted plans, while a form of compensation, represent deferred compensation that is quite different in character from current compensation; i.e., salaries and wages, and are benefits that, under the doctrine of constructive receipt, should be includable in taxable income only when received. Such benefits are designed to serve a different economic purpose—not to provide current income but to provide retirement income. Their tax treatment should recognize their true and unique character. Any attempt to apply the tax principles that are appropriate for wages and voluntary savings derived therefrom is merely a theoretical, however, interesting, exercise.

In Mr. Surrey's statement, he mentions the theoretical study of this kind that appeared in the 1965 Report of the Cabinet Committee on Corporate Pension Funds:

> The Cabinet Committee on Corporate Pension Funds measured the size of a monthly pension that $100 of annual employer's contributions can buy under present tax treatment and compared it with a monthly pension obtained from an equivalent $100 of annual wages, which, after tax, is invested by the employee himself. The pension fund case resulted in a $74 monthly pension as compared to a $52 monthly pension in the case of the employee investing his wages after tax and paying tax on his investment income.[7]

The report also illustrated this relationship in terms of the level annual contribution required for 40 years to produce $100 a month for an employee. It stated:

> If an employer paid his employees wages which were taxed, and from which the employee made pension contributions,

[7] Ibid., p. 413.

> and if the earnings of the pension fund were also taxed, the employer would have to pay $194 a year in wages to enable the worker to buy his $100-a-month pension.
>
> If, as permitted under present rules, the employer makes contributions directly to the pension fund not subject to tax, and if the earnings of the fund are also free from tax, a pension of $100 a month can be financed with an annual contribution of $136. The cost is only 70 percent as much as in the first example because of the twofold saving on the corporate contribution and on the earnings of the fund.[8]

Appendix II hereof is an extended development of the "cost" demonstration of appendix B of the Cabinet Committee report displaying the theoretical benefit of deferred taxation for a 25-year, as well as a 40-year, accumulation period and with respect to several different situations.

The two situations described in the two foregoing quoted paragraphs are called case I and case III, respectively, in appendix B of the Cabinet Committee report. (The same identification is used in appendix II of this paper.) The stated "70 percent" relationship gives an exaggerated picture mainly because the average period of accumulation is probably no more than 25 years (not 40 years) and also because the formula in the report (p. 5 of appendix B.) for case I is incorrect in that the assumed income tax rate on investment earnings after retirement is taken as 18.5 percent (the same as before retirement) instead of 7½ percent, the stated basic assumption. For a 25-year accumulation period, the ratio of the case III figure to the case I figure is 78 percent; i.e., $311.50 is 78 percent of $400.50. The "cost" percentage relationship of case III to case I would be less if a higher interest rate than 4 percent were assumed; e.g., the 40-year period percentage of 72.5 percent (corrected from 70 percent), based on 4-percent interest, is 68.5 percent assuming a 5-percent interest rate. Furthermore, such percentages would be less for marginal income tax rates higher than 18.5 percent.

The Cabinet Committee report also illustrates the situation, case II, where the contribution is included in taxable income but tax on investment income is deferred to the retirement period. This is the status of employee contributions under qualified private plans (and also under plans covering Federal, State, and local government employees). The annual contribution to produce a net income of $1,200 a year beginning at age 65 is $163.50 on the 40-year basis as compared with $136.50 for case III. As shown in appendix II hereof, such annual contribution on the 25-year basis is $369.50 as compared with $311.50 for case III.

In order to illustrate the theoretical benefit of deferred taxation alone, appendix II hereof presents figures for cases I(a), II(a), and III(a) which are the same as cases I, II, and III, respectively, except that the income tax rate assumed for the preretirement period; i.e., 18.5 percent, is also used for the postretirement period. The annual contribution to provide $1,200 a year beginning at age 65 on the 25-year basis for these cases follows:

[8] Report of President's Committee on Corporate Pension Funds, January 1965, p. 16.

Case:	*Annual contribution*
I(a)	$413.50
II(a)	396.00
III(a)	353.50

Of the total reduction of $60 ($413.50−$353.50), $17.50 arises from the theoretical deferral of tax on investment income and $42.50 from the theoretical deferral of tax on contributions. Then, assuming the 7½-percent income tax rate after retirement for case III(a) (thus making it case III), the annual contribution is $311.50 or a further reduction of $42 which includes the benefit of the lower 7½-percent tax rate that would apply in any event to investment income earned after retirement under case I.

Although the theoretical benefit of deferred taxation is frequently spoken of as arising solely from the lower income tax rates in retirement, it is evident that the mere deferment of tax on contributions and investment earnings is more important in these theoretical exercises than the difference in tax rates.

Appendix B of the Cabinet Committee report also presents "cost" figures for a "case IV, a pay-as-you-go plan." A hypothetical internal fund is assumed that earns 4 percent interest, but is taxed at a rate of 31 percent, "taking into account the dividend received deduction, tax-free interest, etc.," resulting in an assumed earnings rate of 2.76 percent. It is then concluded that an annual payment of $201, on a 40-year basis, is required to produce $1,200 a year and that an annual payment of $100 would produce $600 a year beginning at age 65. The basic interest assumption of 4 percent, less 31 percent of tax, is entirely improper and unrealistic since an employer, financing a plan on a pay-as-you-go basis, and setting up balance sheet reserves, may be considered, for this purpose, to enjoy the net rate of return of the funds invested in the business (i.e., after income tax) which may reasonably be expected to be at least 4 percent, much less 2.76 percent, for many employers.

In Mr. Surrey's statement before the Subcommittee on Fiscal Policy, he sought to depict the favorable tax treatment of the employer by comparing a qualified funded plan with a nonqualified funded plan. He said:

> Under a qualified pension plan, an employer may deduct the amount of his contributions to the plan, subject to limitations on overfunding. As noted above, the investment income of the fund is tax free.
>
> If a nonqualified plan does not have immediate vesting, the law does not permit deductibility of current contributions. If the nonqualified plan has such vesting, then the current contributions are deductible.
>
> Through the deductibility of contributions of a qualified plan and the tax exemption of investment income, the Government is sharing pension costs with the employer. Consequently, *the employer is able to provide a given level of benefits at about half the cost of a nonqualified, nonvested plan.*"[9] [Emphasis added.]

[9] Ibid., pp. 413-414.

In appraising "favorable tax treatment"; i.e., the effect on Federal revenues of the tax provisions relating to qualified plans, Mr. Surrey, it is submitted, makes the wrong comparison—the comparison should be made with the alternative of pay-as-you-go financing by the employer and not with a funded nonqualified plan. As will be indicated later in this paper, in the 1942 legislation, in stipulating the requirements for a qualified funded plan that were aimed, mainly, to prevent tax avoidance, it was necessary, in the very nature of things, to stipulate the tax treatment of nonqualified funded plans. Such tax treatment proved to be rather severe. But, an employer is under no compulsion to fund a plan; he is free to finance it on a pay-as-you-go basis and would be greatly impelled to do so if there were highly undesirable tax results on a funded basis. What would be revealed by a long-term comparison of the effect on Federal revenues of advance funding with pay-as-you-go financing?

The following analysis of pay-as-you-go financing versus advance funding is concerned only with the relative financial effects on Federal Government revenues and on the employer's cost of operation; i.e., without regard to other funding considerations such as the desirability of enhancing the security of benefits for employees or a purpose to invest pension funds outside of the employer's business.**

Consider a noncontributory plan now on a pay-as-you-go financing basis. All pension payments made are properly deductible by the employer as a reasonable and necessary business expense whether the plan structure meets "qualification" requirements or not provided the benefits are "reasonable." As a natural tax treatment, the retired employee includes pension payments in his taxable income as received. The employer may be maintaining balance sheet reserves and considers that the pension contributions, in effect, are invested in his business. (Under Opinion 8 of the American Institute of Certified Public Accountants, there must now be an appropriate recognition of currently accruing costs on some recognized actuarial cost method.) The retired employee has no concern with the employer's accounting practice—he pays an income tax as he receives his pension payments. If the employer goes beyond accounting and places funds in a qualified trust or insurance company contract, it still should be of no interest to the retired employee so far as his personal income tax is concerned.

In this process of advance accounting for pension costs by either internal balance sheet reserves or a qualified advance funding operation, the contributions, actual or assumed, and investment earnings, actual or assumed, must match the pension payments, dollar for dollar, over the duration of the pension operation. At first blush, assuming uniform corporate income tax rates throughout the pension operation, it would appear that the capitalized value of tax deductions on the pay-as-you-go basis should be equal to the capitalized value of the corresponding tax deductions for contributions and investment earnings under advance funding. The situation, however, is not that simple.

**Furthermore, no attempt has been made to explore the implications of situations where, in choosing between financing methods, the employer cannot use additional capital profitably or, if the employer can, such capital is available on good terms from sources other than foregone advance pension funding contributions.

It is complicated by the need to recognize the value of money to the Government over a span of years, the net earnings rate of a pension fund, the gross earnings rate of the employer's business and the period of years over which investment earnings are realized or recognized; i.e., the average date from which funding contributions would be made to the average date of pension payments.

These considerations are encapsulated by algebraic formulas contained in appendix III hereof. There are also shown, using such formulas, numerical illustrations of the extent of the advantage or disadvantage to the Federal Government of advance funding versus pay-as-you-go financing. The value of money to the Government is the rate paid on borrowed funds less the proportion, recovered in taxes, of the interest paid on such borrowed funds. Three values are assumed. The first, 3 percent, assumes that money is borrowed at 4½ percent and the interest is taxed at an average rate of 33⅓ percent, the mean of 18⅔ percent by individuals and 48 percent by corporations. (This assumes a 50–50 division of holdings by individuals and corporations which seems reasonable in the absence of specific information.) A second value of 2.67 percent is based on a borrowing rate of 4 percent and a one-third recovery from taxes. The third rate of 2.08 percent also assumes a borrowing rate of 4 percent, but the corporate tax rate of 48 percent. A range of rates of return of a pension fund and the gross rate of earnings of a business are used. For the period of years over which investment earnings are realized or recognized, two values are used—25 and 30 years. It is probable that a typical average accumulation period before retirement age is 20 years and after retirement age is 7½ years, a total of 27½ years.

The numerical illustrations are in the form of the ratio of—

(*a*) The value of taxes receivable by the Federal Government on a pay-as-you-go basis, to

(*b*) The value of taxes foregone by the Federal Government under advance funding.

Certain conclusions may be drawn from these illustrations:

(i) Where the rate of investment earnings of a pension fund is high in relation to the gross earnings rate of a business, there is a decided tax advantage to the Government by advance funding. This high rate of investment earnings of a pension fund will affect taxes either by materially reducing deductible amounts (and hence increasing the taxes collected on an advance funding basis) or by materially increasing the amount of benefit that are not deductible during the payout period on a funded basis; i.e., the employer is at a disadvantage since he cannot deduct these enhanced amounts which would have been deductible on the pay-as-you-go basis.

(ii) The longer the investment earnings period, generally speaking, the larger is the area that is favorable to the Government under advance funding.

(iii) There is a middle area where advance funding is to the advantage of the employer and not to the Government. This disadvantage may be represented by 10 to 20 percent less in the value of taxes collected.

(iv) Where the rate of investment earnings of a pension fund is quite low in relation to the gross earnings rate of a business, advance

funding is to the financial disadvantage of both the employer and the Government.

(v) Based on the illustrations in appendix III, there is shown below the rate of pension fund investment earnings that will produce a matching of the value of taxes on the pay-as-you-go basis with that on an advance funding basis, assuming an average investment earnings period of 27½ years. Where the indicated relationship exists, advance funding is to the advantage of the employer but the Federal Government can afford to be indifferent—k is the rate of the net cost of money to the Government.

[In percent]

Employer's gross earnings rate	Pension fund rate of return		
	k=3 percent	k=2.67 percent	k=2.08 percent
5 percent	4.91	4.64	4.17
5½ percent	5.11	4.85	4.39
6 percent	5.31	5.06	4.61
7½ percent	5.94	5.70	5.28
10 percent	7.01	6.78	6.39
12½ percent	8.11	7.92	7.56
15 percent	9.+	9.+	8.76

(vi) In view of the realized or expected return on funds that are invested substantially in common stocks ranging up to 9 percent, it would appear that there are many plans where the Government will enjoy a decided advantage by reason of advance funding. Considering the entire range and character of private pension operations over the years to come, can anyone say, with any degree of confidence or factual support, that advance funding of pensions, with tax-free input, will be any more costly to the Government than the pay-as-you-go financing of the same benefits under such plans would have been, with tax-free output?

PRACTICAL AND LEGAL CONSIDERATIONS

So much for a theoretical mathematical analysis. But what are the realities?

As we frequently hear, did the Congress, in the 1942 legislation, overtly and purposefully enact "special tax privileges" to encourage the adoption and development of private retirement plans? In the work by Dr. Robbins, published by the Industrial Relations Counselors in 1949, referred to in Section II hereof, we find a thoughtful interpretation of the objectives of the 1942 legislation. This is significant, since it appeared only a few years after 1942 when little time had elapsed for mythmaking. Here is what Dr. Robbins wrote:

> PURPOSES OF MAKING EMPLOYER CONTRIBUTIONS TAX-FREE
> * * * Just why should not the employer contribution be taxable income to the employee immediately in all cases? One answer is * * * that it is not at the command of the employee; he can do nothing with it; he cannot use it to buy groceries or to pay taxes; he is not sure he will ever receive it; in fact, under most pension plans, no fixed amount is allocated to a particular employee; a sum set aside on behalf of all of a class of employees is to be of value to those in

this class who happen to remain in service until pension payments fall due. Hence, as a rule it would be impossible or very difficult to fix upon the part of the employer's contribution that should be called income to a particular employee at the time the contribution is made.

The earlier rulings that employer contributions were deductible as ordinary and necessary expenses seem clearly to have rested on a conviction that these were reasonable business expenses similar in many respects to wages and salaries. *There is no evidence that decisions were based on a desire to encourage pension plans.* Apparently no heated contests were involved and to have ruled that such contributions were not ordinary and necessary expenses would perhaps have been interpreted as direct hostility to the provisions of retirement benefits.

The provision of subsection 23(p) of the 1942 Revenue Act, explicitly exempting employer contributions for the first time, *was clearly restrictive* as compared with earlier rules and regulations, the restriction showing evidence of being *designed to minimize tax avoidance.*

REASONS FOR TAX-FREE PENSION TRUSTS.—In section 165, which frees employee benefit trustees from taxation, the case for liberality of treatment may seem clearer. Here the government postpones taxes on the income from trust investments until trust funds are distributed and the argument is not available that this income is a necessary expense to the employer similar to compensation. But, *there is good administrative reason for this tax treatment that has nothing to do with liberality.*

The Government could consider a pension trust as a third party, an artificial person, and tax it on the income from its investments. But * * * it is difficult, if not impossible, to isolate the employer contribution with respect to a particular individual. And, even if this is possible, note the complications when pension payments are made if trust fund income is taxed earlier. The pensioner should be taxed on the part of each payment that represents employer contributions, but should not be taxed on the part that represents interest on the trust fund. Bear in mind also that the part of a particular pensioner's payments that arises from interest depends in a complicated manner upon his age, sex, period of service, period the pension has been paid, and the provisions of the plan with respect to payments at death and withdrawal from service. *With these complications in mind, it seems that Congress did well to postpone taxing income of employee-benefit trust funds, quite regardless of any thought of encouraging deferred compensation plans.*

PURPOSES OF 1942 LEGISLATION.—* * * The 1942 legislation doubtless was belated recognition of an immense administrative problem that was bound to arise with a combination of high tax rates and an effort to control compensation payments. It stemmed partly from a determination to minimize tax

avoidance and partly from the related necessity of dealing promptly with an avalanche of new pension and profit-sharing plans. It formalized tax rules that had been used with relatively little controversy when tax rates where low and added important details with the *objective of minimizing both controversy and tax avoidance. It was distinctly restrictive legislation.*[10] [Emphasis added.]

If the 1942 legislation, defining "qualified" plans and by the same token defining "nonqualified plans," were repealed and not replaced, would general principles of taxation permit most of the present practices? In a carefully reasoned article, Raymond Goetz (partner of Seyfarth, Shaw, Fairweather & Geraldson, Chicago, Ill.) presents a persuasive case that this would be true. This is his concluding statement:

CONCLUSION.—If the special Code provisions applicable to qualified pension plans were repealed (along with the accompanying special rules on nonqualified plans), Federal income tax results under most such plans probably would not be materially altered:

(1) Employer irrevocable contributions to a separate and independent trust fund, or to an insurance company, to provide pension benefits for employees, would be deductible from gross income of the employer in the year paid, as an ordinary and necessary business expense.

(2) Employees would be taxable only on amounts distributed or made available to them from such funds, in the year in which so distributed or made available (but any current death benefit would be taxable currently as life insurance).

The only real question of current employee taxation might be with respect to an employer contribution which is fully vested in the employee and guaranteed by an insurance contract. Even here, the contingency of survival to retirement age ought to be sufficient to defer tax on the employee.

Some fund investment income probably would be subject to income tax:

(1) In the case of trusteed pension funds, at individual tax rates applicable to personal trusts, but only after deduction of benefit distributions for the year.

(2) In the case of insured pension funds, at the corporate rates applicable to insurance company investment income generally.

Such taxation of fund income would create obvious inequities between various pension trusts, between insured pension funds and pension trusts, and between various types of insurance company investment income.

Thus, the tax rules under discussion do not appear to involve any substantial departure from sound fundamentals of income taxation. Instead, these rules merely codify certain logical tax consequences under qualified pension plans as to

[10] "Impact of Taxes on Industrial Pension Plans," Rainard B. Robbins, Industrial Relations Counselors, Inc., 1949, pp. 52–55.

the *timing* of employer expense deductions and employee taxable income. Broadly stated, these consequences are: employer deduction at the time of payment, and employee tax upon receipt or availability of cash. These give the appearance of tax benefits only when compared to the results under dissimilar forms of employee compensation, such as wages. As the foregoing analysis indicates, *the tax results flowing from qualified pension plans seem appropriate to the nature of the compensation arrangement involved.* [Emphasis added.] This is perhaps best demonstrated by reference to the corresponding tax treatment of employer contributions and employee benefits under the basically similar supplemental unemployment benefit plans, which are not the object of any special code provisions covering employer expense deduction or employee taxable income.[11]

In his statement before the Subcommittee on Fiscal Policy, Mr. Surrey presented a different interpretation of the general principles of tax law and claimed that the "special tax treatment" for qualified plans resulted in an estimated tax "cost" to the Federal Government of $3 billion. He said:

I want to make clear that qualified pension plans do get a special tax treatment and that deferral would not automatically follow as a matter of the application of the general principles of tax law.

With regard to the employer's deduction, the general rule is that an amount is deductible under the tax law when there is fixed liability on the employer to make a fixed payment to a definite person. If the employer is on an accrual basis, he may take a deduction even though he does not have to make the payment immediately, but the liability for payment must be fixed.

With regard to an employer's contribution to a pension plan where the employee's benefits are not vested, all that is involved for the employer is the possibility that he may have to make a pension payment to some employee in the future. This possibility of future payment is not sufficient under the general principles of tax law to permit an accrual of the deduction.

With regard to the employee, it would seem clear that if the pension contribution is not vested in the employee, there is no basis for taxing the employee currently at the time that the employer's contribution is made. This is the particular case where, as I pointed out, deductibility to the employer constitutes a particular benefit granted under the present law.

Where the contribution by the employer is vested at the time made, or where it becomes vested at a later point before the employee receives the pension, the general principles of tax law would suggest that the employee should be taxable at that time. It is not controlling that the employee receives no cash money at that time.

[11] "The Myth of Special Tax Concessions for Qualified Pension Plans," Iowa Law Review, Spring 1966. Raymond Goetz, pp. 580–581.

If I do a piece of work for you and my payment for the job is a paid-up insurance policy that will provide a life annuity beginning when I am 65 years old, I have clearly gotten something of value for this work. Under general principles of tax law, I am required to include in my income the value of the insurance policy that I have received. The special benefit provided for employees under qualified pension plans is that when they receive something of value in the form of a vested benefit to a pension the tax on this amount is deferred until they get cash.

Finally, it is clear that the investment income of a pension trust would be taxable under general principles of tax law except for the benefits extended to qualified plans.

If the total amount contributed by employers to qualified pension plans and the investment income of the funds were taxable, at individual rates, the revenues would rise by about rent levels by about $3.8 billion per year. If the amounts were taxable at individual rates, the revenues would rise by about $1.4 billion a year. The appropriate rate, as I have indicated, depends on whether or not the benefits were vested. Therefore, the cost in revenue of the Federal Government because of the existing pension plan provisions falls somewhere between the two limits of $3.8 billion and $1.4 billion. (These estimates take into account the current tax being paid on benefits.) Since there is some degree of vesting, we may put this cost very roundly at about $3 billion.[12]

If Mr. Goetz is right as to the operation of the general principles of tax law, the tax treatment of employer contributions would remain essentially the same and Federal revenues would not be materially altered, much less increased by Mr. Surrey's theoretical alleged "tax loss" of $3 billion.

If Mr. Surrey's interpretation of the general principles of tax law is correct, what would be the effect of the repeal of the "special legislation for pension plans?" Would Federal revenues, in fact, be increased by $3 billion? As a practical matter, could funded pension plans function satisfactorily?

If the $6.2 billion employer contributions made in 1965 on a collective basis for qualified plans were not currently deductible by employers, an intolerable situation would exist that would give rise to widespread vigorous protest and stimulate many employers to shift to pay-as-you-go financing. Although current revenues in this event would be temporarily increased, deductions corresponding to advance funding contributions and investment income thereon would eventually be taken that could range from amounts of significantly greater value to significantly lesser value than contributions and investment income. (See app. III.) Such abandonment of advance funding would weaken employee pension security and diminish an important source of savings and capital supply. The decline in advance funding would be in conflict with the current objective of the President's Committee on Corporate Pension Funds to improve pension funding.

[12] Ibid., pp. 414–415.

As for the employee's situation, it would be intolerable to ask an employee to include in taxable income the value of accrued benefits at the point of vesting (assuming that such value under collective funding could be precisely determined—a highly invalid assumption) which could amount to as much as 3 or 4 years' annual wage or salary. Under contributory plans where vesting of benefits provided by employer contributions is usually forfeited if a terminating employee cashes out his own contributions (e.g., the civil service retirement plan), how and when would the employee be taxed on the value of vested benefits? There is no unconditional vesting until retirement age when the value, again, could be several years' wage or salary.

Mr. Surrey's case for "special treatment" can be sustained only if there is an equitable and workable alternative. It should be evident from the foregoing picture of the practical situation that there is no such alternative and, consequently, the present tax treatment of employer contributions is the natural method.

As to the taxation of investment earnings, we have noted earlier the great administrative problems as outlined by Robbins. Mr. Goetz has indicated that, under general principles of tax law, when a trust is taxed as a separate entity, trust income is intended to be taxed only once, to either the trust or the beneficiary. Thus benefit distributions would be deducted from trust taxable income. If this were done, what would the figures look like? Using Holland's [13] "preferred" projection of private pension plan contributions, benefits, and funds it is evident that, in the aggregate, benefit payments will exceed investment income shortly after 1970.

[In billions]

Year	Investment income (1)	Benefit payments (2)	Excess of (1) over (2) (3)
1965	$3.2	$2.8	$0.4
1970	4.7	4.5	0.2
1975	6.2	6.9	−0.7
1980	7.8	9.8	−2.0

It is clear that the revenue from this source would be a rapidly disappearing resource. Of course, the Congress, in its wisdom, might legislate a special tax on investment income of qualified pension plan funds simply for the privilege of operating a plan in our society—but such legislation would appear to be contrary to the treatment of a taxable trust in accordance with the general principles of tax law.

The deferred tax treatment of employer contributions (and investment income on both employee and employer contributions) for plans covering Federal, State, and local government employees, a public policy accepted without question, further fortifies the proposition that the same deferred tax treatment for qualified private plans is the natural method of treatment. Funds for State and local government plans are now of significant proportions and are growing more rapidly

[13] Daniel M. Holland, "Private Pension Funds: Projected Growth," Occasional Paper 97, National Bureau of Economic Research, tables 24 and 28.

than those in the private sector. In 1965, contributions were $4.2 billion (60 percent by employers), benefit payments were $1.7 billion and estimated investment earnings were about $1.5 billion. If these plans covered private employees, the same type of calculation that produced Mr. Surrey's $3 billion assumed tax loss would account for another $1 billion. This hypothetical figure does not include the operations of plans for Federal civilian employees under which 1965 contributions were $2.2 billion and benefit payments were $1.4 billion.

Two conclusions seem inescapable from this survey of the (i) objectives of the 1942 legislation as described by Robbins, (ii) the contrasting analysis of the general principles of tax law of Goetz and Surrey, and (iii) a realistic examination of the practical situation:

(1) The present deferred tax treatment is the natural treatment since, for the vast majority of plans, there is no workable reasonable or acceptable alternative, and

(2) The alleged $3 billion of "tax cost," developed by the Treasury Department from a fanciful excursion into an unreal world, would not, by eliminating the present tax treatment of qualified plans, be recovered in the form of additional revenues.

ECONOMIC CONSIDERATIONS

In addition to theoretical mathematical considerations and practical and legal considerations, it is appropriate to recognize that, if advance funding of pension plans provides additional capital and, in turn, increased productivity, Federal revenues will be enhanced by taxation of the income associated with this increased productivity. It is then fair and reasonable to recognize, also, that any such additional revenue can be a significant offset to any net loss of revenue resulting directly from advance funding, whether such loss is of a theoretical mathematical character or results from extending the principle of deferred taxation to employee pension plan contributions and to retirement provisions of persons not covered by such plans, as recommended in this paper.

As evidenced by the recently published studies of Cagan and Katona, private pension plan coverage is associated with higher individual discretionary savings. Cagan reached this conclusion:

> Our analysis . . . suggests that when households come under a pension plan, offsetting reductions in other saving do not occur. *The net addition to aggregate personal savings apparently equals the full amount of employees' and employers' contributions.* In chapter 6 it was concluded that business and Government saving is probably reduced by 10–20 percent of the growth in pension funds. Though there is no direct evidence for this conclusion, general considerations support it. Hence, *80–90 percent of pension fund growth constitutes a net addition to national saving.* We found no evidence that this addition will be temporary; at least it was not lower for older persons, or for those covered a longer period of time, who would be more aware and more sensitive to provisions for

retirement, as the rest of the population will be in time.[14] [Emphasis added.]

Here is Katona's conclusion as to the effect of private pension plan coverage on individual savings behavior:

> Under the conditions that prevail today, coverage by private pension plans stimulate individual saving. The notion that people tend to reduce the amounts they voluntarily save by the amounts they are compelled to save through their own and their employer's contributions to pension plans has been contradicted. So has the argument that expectation of retirement income from pension plans weakens motivation to save and induces more liberal spending.[15]

The determination of the extent of increased Federal revenues from this source is a project worthy of careful research. Only with this knowledge, along with an appreciation of the limited significance of theoretically calculated "tax losses" and an understanding of the practical and legal aspects, can a comprehensive and total view of the Federal income tax treatment of provisions for retirement be obtained.

IV. Summary

The facilitation of lifetime income spreading by deferred taxation of contributions and investment income thereon is a natural and logical means of assuring income in old age. Such deferred taxation should be available to all persons in our society and should apply to all genuine programs of retirement income provision. Three areas require attention in order to remove undesirable discrimination and categorical taxation:

(i) Employee contributions under employer-instituted plans;

(ii) Contributions, and associated investment income, by persons not covered by such plans; and

(iii) The OASDI system.

Furthermore, the deferred taxation principle should be made available to persons who have attained age 65 in order to encourage productive second careers, to facilitate the leveling out of old-age income and to afford a means of offsetting the erosion of inflation.

The present Federal income tax treatment of employer contributions and investment income for qualified pension plans, a long existing application of the principle of deferred taxation, is the natural method of treatment since—

(i) There is no workable or equitable alternative for the vast majority of plans as they operate today;

(ii) There are persuasive arguments that the treatment conforms to the general principles of tax law; and

(iii) This treatment, as to the employee, has been accepted for many years, without question and without special legislation, for plans covering Government employees.

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[14] Phillip Cagan, "The Effect of Pension Plans on Aggregate Saving," National Bureau of Economic Research, Occasional Paper 95, 1965, p. 82.

[15] George Katona, "Private Pensions and Individual Savings," Survey Research Center, Institute for Social Research, University of Michigan, 1965, p. 90.

If the 1942 legislation identifying qualified plans were repealed, there is no evidence that Federal revenues would be increased by the $3 billion a year of "tax loss" alleged by Treasury officials as arising from the "favorable" tax treatment of qualified plans although such repeal would alter the incidence of tax collections over the years. Furthermore, until there is better understanding and knowledge of the total economic effects of advance funding versus pay-as-you-go financing, no one can say what, in fact, will be the ultimate long-range effect on Federal revenues of the advance funding of provisions for old-age income.

APPENDIX I

TAX-EXEMPT STATUS OF OASDI BENEFITS

Statement by Gerard M. Brannon, Director, Office of Tax Analysis, U.S. Treasury Department, at hearing before Special Committee on Aging, U.S. Senate, June 15, 1966 (p. 4 of Hearings Report):

Social Security benefits were exempted from tax not by law but by revenue ruling on the theory that they were gifts—a theory inconsistent with the treatment of pension income and with the general view of OASDI as a contributory pension system. In the 1930's, it was still true, however, that the income tax applied only to the moderately high-income people; and it still did not make much practical difference whether Social Security payments were excluded. For both social security and railroad retirement, the usual tax rules would indicate that the recovery of the employee's own contribution should be tax free. For people retiring in 1966, this would at most result in about 89 percent of OASI benefits being included in income for tax purposes and 78 percent of railroad retirement benefits; that would be the result if they were treated like other kinds of pensions.

Statement by Hon. Stanley S. Surrey, Assistant Secretary of the Treasury for Tax Policy, at hearings before the Committee on Ways and Means, March 1, 1967 (p. 196 of Hearings Report):

There is no sound principle that supports a complete exclusion for social security and railroad retirement benefits. These benefits are essentially in the nature of retirement income benefits and are comparable to those paid from a private retirement plan. The exclusion of social security retirement benefits is a tax anachronism granted administratively in the days when benefits were low, and the social security system was in its infancy and viewed as a "welfare" program. The exclusion of railroad retirement benefits was granted by a different committee to create parity of treatment with social security. To continue these exclusions as benefits grow will accentuate (1) the greater tax benefits given to the wealthy and (2) the arbitrary differences in tax treatment of elderly individuals with the same total incomes which now result from treating various kinds of income differently.

Opinion of Fred B. Smith, General Counsel of the Treasury Department filed with the Committee on Ways and Means, March 3, 1967 (pp. 374–377 of Hearings Report):

Annuities under the Social Security Act, as amended, are not statutorily exempt from tax, as are comparable annuities under the Railroad Retirement Acts. However, the Internal Revenue Service has ruled, without discussion, that they are not subject to Federal income tax (I.T. 3447, C.B. 1941–1.191). But this ruling's position does not reflect any constitutional mandate, as an analysis of Revenue Ruling 66–34 reveals. * * * It has been suggested that social security benefits are "gifts or gratituities".[1]

The Government so argued in *Helvering* v. *Davis*, which sustained the validity of the Social Security Act. But this argument was simply the logical corollary of the Government's theory of that case—that the Act involved the exercise of two separate and distinct powers, the taxing power and the power to spend for the general welfare. In other words, the taxes collected under title VIII were not earmarked to pay title II benefits. The Court upheld the act as a valid exercise of Congress' power to spend money in aid of the general welfare and its power to tax, against the contention that it violated the 10th amendment, but said nothing about the character of the benefits in the hands of the recipients. The decision has been cited many times in other court opinions, but never for the proposition

[1] The argument that social security benefits are gifts or gratuities seemingly ignores the fact that the social security system is financed entirely out of contributions via taxes by employers, employees and the self-employed. The fundamental concept of this program of social insurance has been that the individual contributes part of his earnings during his working life in order to keep receiving income during his retirement years as a matter of earned right rather than as a gratuity.

that it held social security benefits to be gifts or gratuities. In the 1939 amendments to the Social Security Act, Congress clearly tied the taxes to the benefits by earmarking the amount of the social security taxes collected for the benefits granted.

It seems fruitless to engage in conceptualization regarding the essential nature of social security benefits as earned rights or gratuities. The only question which is constitutionally relevant is whether such benefits are income under the 16th amendment. As I have indicated above, they are * * *.

Based upon the above analysis, it is my opinion that annuities or pensions received under the Railroad Retirement or Social Security Acts may be included in gross income as proposed without violating the 16th amendment or any other constitutional requirement.

Excerpt from Ways and Means Committee hearing, March 3, 1967. (Exchange between Congressman Curtis and Assistant Secretary Surrey, p. 378 of Hearings Report:)

Mr. SURREY. Even if for the sake of discussion social security is called a gratuity, the tax treatment would present only a question of interpretation of present law which has a statement in it that gifts and gratuities are not taxable.

Mr. CURTIS. That is right.

Mr. SURREY. It would not deal with the question of whether Congress if it cared to, wanted to say these were taxable.

Mr. CURTIS. I am simply saying in establishing the basic theory of social security it was clear that these were gratuities, not rights that could be enforced, something that Congress could take away tomorrow. Congress can't take away the rights under the civil service retirement program. These are contractual rights. * * * They can alter this, and this was the basis, I am suggesting, or had a great deal to do with the Treasury rulings that social security benefits were not to be taxed * * *. Congress can come along and say that we want to tax this form of gratuity.

APPENDIX II

THEORETICAL BENEFIT OF DEFERRED TAXATION

A. ILLUSTRATION OF EFFECT OF DIFFERENT RATES OF TAX AND TIMING OF TAX WITH RESPECT TO CONTRIBUTIONS AND INVESTMENT INCOME.

Case	Tax rate and timing: Contributions	Tax rate and timing: Investment income	Annual contribution to produce $1,200, net—: For 25 yr.	Annual contribution to produce $1,200, net—: For 40 yr.
I(a)	18.5 percent; current	18.5 percent; current before and after age 65.	$413.50	$195.00
I	do	18.5 percent; current before age 65; 7½ percent, current after age 65.	400.50	188.50
II(a)	do	18.5 percent; deferred after age 65.	396.00	178.00
II	do	7½ percent; deferred after age 65	369.50	163.50
III(a)	18.5 percent; deferred after age 65	18.5 percent; deferred after age 65	353.50	155.00
III	7½ percent; deferred after age 65	7½ percent; deferred after age 65	311.50	136.50

B. FORMULAS

Case I(a):

$$X(0.815)\overline{S}_{\overline{n}/(3.26\%)}=Y\overline{a}_{\overline{65}}{}^{(4\%)}$$

where

$$Y-0.185\left(Y-\frac{X(0.815)\overline{S}_{\overline{n}/(3.26\%)}}{\ddot{s}_{\overline{65}}}\right)=1,200.$$

Case I:

$$X(0.815)\overline{S}_{\overline{n}/(3.26\%)}=Y\overline{a}_{\overline{65}}{}^{(4\%)}$$

where

$$Y-0.075\left(Y-\frac{X(0.815)\overline{S}_{\overline{n}/(3.26\%)}}{\ddot{s}_{\overline{65}}}\right)=1,200.$$

(Corrected formula for case I of appendix B of Cabinet committee report.)

Case II(a):

$$X(0.815)\overline{S}_{\overline{n}/(4\%)}=Y\overline{a}_{\overline{65}}{}^{(4\%)}$$

where

$$Y-0.185\left(Y-\frac{X(0.815)(n)}{\ddot{s}_{\overline{65}}}\right)=1,200.$$

Case II:

$$X(0.815)\overline{S}_{\overline{n}/(4\%)}=Y\overline{a}_{\overline{65}}{}^{(4\%)}$$

where

$$Y-0.075\left(Y-\frac{X(0.815)(n)}{\ddot{s}_{\overline{65}}}\right)=1,200.$$

(This formula for case II, as shown in the appendix B of the report, is incorrectly stated therein although it was correctly applied.)

Case III(a):

$$X\overline{S}_{\overline{n}/(4\%)}=\frac{1,200}{0.815}\ddot{a}_{\overline{65}}{}^{(4\%)}.$$

Case III:

$$X\bar{S}_{\overline{n}/(4\%)}=\frac{1{,}200}{0.925}\bar{a}_{65}{}^{(4\%)}.$$

Factors used:

$$\bar{S}_{\overline{25}/(4\%)}=42.4743;\ \bar{S}_{\overline{25}/(3.26\%)}=38.3143.$$

$$\bar{S}_{\overline{40}/(4\%)}=96.914;\ \bar{S}_{\overline{40}/(3.26\%)}=81.302.$$

$$\bar{a}_{65}{}^{(4\%)}=10.1987;\ \bar{a}_{65}{}^{(3.26\%)}=10.7827;\ \delta_{65}=14.206.$$

Case	Values of quantity Y	
	n=25	n=40
I(a)	1266.09	1266.09
I	1226.00	1226.00
II(a)	1343.48	1379.63
II	1254.31	1266.87

APPENDIX III

Pay-As-You-Go Financing Versus Advance Funding

A. ALGEBRAIC ANALYSIS

An employer who contributes $1 now to his pension fund will thereby be able to discharge a benefit payment of $\$(1+j)$ 1 year later, or more generally $\$(1+j)^n$ n years later, where j is the annual net yield of the pension fund. A taxpaying employer also gets a $1 deduction now for income tax purposes.

On the other hand, if the employer does not fund in advance, he keeps his $1, less taxes at rate t (assuming the employer would contribute from current earnings), and can invest it in his business or elsewhere at an annual rate of return of i before taxes, or $i(1-t)$ after taxes. When, n years later, he makes the benefit payment of $\$(1+j)^n$, the resulting deduction reduces his taxes by $t(1+j)^n$.

The employer's choice of financing method has two important consequences:

(1) *For the employer.*—Making the comparison at time n, pay-as-you-go financing is better for the employer if the amount gained by not funding in advance; i.e., $\$(1-t)[1+i(1-t)]^n$ is more than the net cost of the benefit; i.e., $\$(1-t)\ (1+j)^n$. Advance funding is preferable for the employer if and only if $j>i(1-t)$.

(2) *For the Federal Government.*—Suppose money is worth k percent per year to the Federal Government. Then, making the comparison at time n, pay-as-you-go financing is better for the Federal Government if the value of the taxes on the original $1 and on its subsequent earnings; i.e.,

$$\$t(1+k)^n+\$ti(1-t)\sum_{r=0}^{r=n-1}[1+i(1-t)]^r(1+k)^{n-r-1}$$

$$=\$t(1+k)^n+\$it(1-t)\ \frac{[1+i(1-t)]^n-1+k)^n}{[1+i)1-t)]\ -1+k)}$$

is more than the tax loss at time n, which is $\$t(1+j)^n$.

Advance funding is preferable for the Federal Government if and only if

$$t(1+j)^n>t(1+k)^n+it(1-t)\frac{[1+i(1-t)]^n-(1+k)^n}{[1+i(1-t)]\ -(1+k)}.$$

(Note.—Formulas developed by Harrison Givens, Jr., associate actuary of the Equitable Life Assurance Society.)

B. NUMERICAL ILLUSTRATIONS

RATIO OF VALUE OF TAXES RECEIVABLE UNDER PAY-AS-YOU-GO FINANCING TO VALUE OF TAXES FOREGONE UNDER ADVANCE FUNDING

3 PERCENT (66⅔ PERCENT OF 4.5 PERCENT): NET VALUE OF MONEY TO GOVERNMENT

Employer's gross earnings rate (percent)	Average investment earnings period (years)	Percent rate of return on pension fund							
		4	4½	5	5½	6	7	8	9
5	25	0.795	0.896	1.099	1.137	1.279	1.618	2.041	2.570
	30	.779	.899	1.038	1.196	1.379	1.827	2.416	3.185
5½	25	.757	.853	.961	1.082	1.218	1.540	1.944	2.447
	30	.735	.849	.980	1.130	1.302	1.726	2.282	3.009
6	25	.720	.812	.915	1.030	1.159	1.466	1.850	2.329
	30	.694	.802	.925	1.067	1.230	1.630	2.154	2.841
7½	25	.620	.699	.788	.887	.999	1.263	1.593	2.006
	30	.583	.673	.777	.896	1.032	1.368	1.809	2.385
10	25	.481	.543	.611	.688	.775	.980	1.236	1.557
	30	.432	.499	.576	.664	.765	1.014	1.341	1.768
12½	25	.372	.419	.472	.532	.598	.757	.955	1.202
	30	.318	.367	.424	.488	.563	.746	.986	1.300
15	25	.286	.323	.363	.409	.461	.583	.735	.926
	30	.232	.268	.310	.357	.412	.546	.721	.951

2.67 PERCENT (66⅔ PERCENT OF 4 PERCENT): NET VALUE OF MONEY TO GOVERNMENT

5	25	0.847	0.995	1.076	1.212	1.364	1.725	2.177	2.741
	30	.840	.970	1.119	1.290	1.487	1.971	2.605	3.435
5½	25	.806	.908	1.024	1.153	1.297	1.631	2.070	2.606
	30	.792	.914	1.055	1.216	1.402	1.858	2.456	3.238
6	25	.766	.864	.973	1.096	1.232	1.559	1.968	2.478
	30	.746	.862	.994	1.146	1.321	1.751	2.315	3.052
7½	25	.657	.741	.835	.940	1.058	1.338	1.688	2.125
	30	.623	.719	.830	.957	1.103	1.462	1.933	2.549
10	25	.507	.571	.644	.725	.816	1.032	1.302	1.639
	30	.458	.529	.611	.704	.811	1.075	1.422	1.874
12½	25	.389	.439	.495	.557	.627	.793	1.000	1.260
	30	.335	.387	.446	.514	.593	.786	1.039	1.369
15	25	.298	.336	.379	.427	.480	.607	.766	.965
	30	.243	.281	.324	.374	.431	.571	.755	.996

B. NUMERICAL ILLUSTRATIONS—continued

RATIO OF VALUE OF TAXES RECEIVABLE UNDER PAY-AS-YOU-GO FINANCING TO VALUE OF TAXES FOREGONE UNDER ADVANCE FUNDING—Continued

2.08 PERCENT (52 PERCENT OF 4 PERCENT): NET VALUE OF MONEY TO GOVERNMENT

5	25	0.950	1.071	1.207	1.359	1.529	1.934	2.441	3.073
	30	.959	1.108	1.278	1.474	1.699	2.251	2.976	3.924
5½	25	.901	1.016	1.144	1.289	1.450	1.834	2.314	2.914
	30	.901	1.041	1.201	1.385	1.596	2.115	2.796	3.687
6	25	.854	.963	1.085	1.222	1.375	1.739	2.195	2.763
	30	.846	.977	1.128	1.301	1.499	1.987	2.626	3.463
7½	25	.727	.820	.924	1.041	1.171	1.481	1.869	2.353
	30	.700	.808	.933	1.076	1.240	1.643	2.172	2.864
10	25	.555	.626	.705	.794	.893	1.130	1.426	1.795
	30	.508	.586	.676	.780	.899	1.191	1.575	2.076
12½	25	.422	.476	.536	.604	.680	.860	1.085	1.366
	30	.366	.423	.488	.563	.649	.860	1.136	1.498
15	25	.321	.362	.408	.459	.517	.653	.824	1.038
	30	.264	.304	.351	.405	.467	.619	.818	1.078

NOTES

"Northeast" area: Advance funding favorable to both Government and employer.
Middle area: Advance funding favorable to employer, unfavorable to Government.
"Southwest" area: Advance funding unfavorable to both Government and employer.

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