Actuarial Aspects of Financing Old-Age and Survivors Insurance

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Detailed study of the actuarial basis for the insurance program preceded the adoption of the Social Security Act, and the financing provisions have been reexamined before each major revision of the act. The methods of financing the program under the various amendments and some of the most important proposals that have been made are reported in the following pages.

THE Social Security Act in 1935 established a dual program of protection against old-age dependency—old-age benefits, a contributory social insurance system covering primarily industrial and commercial workers; and old-age assistance, a program administered by the States (but partly financed by the Federal Government) to give financial assistance to aged persons who were in need. Under both programs, the "aged" were defined as persons aged 65 and over.

In theory, a broad national social insurance program should, at least eventually, meet virtually the entire problem of old-age dependency. A public assistance program should be designed primarily to help those already aged when the dual program began, although there may always be some need of assistance for persons with special needs. The social insurance program would have to be applicable to all types of employment rather than merely to industrial and commercial workers. It was believed, when the Social Security Act was adopted, that extension of coverage would be largely an administrative problem that could be solved by subsequent legislation after the system was established and operational experience had developed. Accordingly, at some future date the social insurance program would completely, or almost completely, eliminate the need for old-age assistance.[1]

In 1939 the social insurance system was broadened to include survivor benefits, and its official name became "old-age and survivors insurance." At the same time the name of the fund was changed from "old-age reserve account" to "old-age and survivors insurance trust fund." In 1950 the law was amended to cover more workers—chiefly self-employed workers (other than farmers and professional workers) and certain domestic servants, certain farm laborers, employees of nonprofit institutions (on an elective basis), and some Government employees. The amendments also raised the benefit level about 80 percent to take into account changes in wage levels and cost of living during the previous decade. In 1952 the program was further amended; the major change was an increase of 10–15 percent in benefit amounts, again to take into account the increases in wage levels above those prevailing when the 1950 amendments were being enacted.

This article deals with the financing aspects of the old-age and survivors insurance program. The actual financial bases of the system are set forth,[2] as well as the most important proposals made for financing the program. Methods of financing and investment procedures are treated separately.

Why a Fund Develops

Any discussion of the actual operations and the financial basis of the old-age and survivors insurance program should be prefaced by a summary of the reasons for and methods by which a fund[3] develops under any pension plan or under any type of insurance system.

Under almost any pension system, the cost of the benefits will rise for many years after the program is inaugurated. There are many factors that produce this result, but not all the factors are present in every instance. Among such factors are (a) the increasing proportion of the aged in the population (almost invariably present as a result of continual improvement in mortality at all ages in the past); (b) the greater proportion of younger persons than of older persons covered when the system is established (partly because of the omission of all or some of the current aged, who had already retired); and (c) the basing of benefits to a greater or lesser degree on the length of time that contributions are made (so that benefits in the early years of operation are smaller than those that will be paid ultimately).

If the rising benefit cost is to be met by a level contribution rate, contribution receipts in the early years of operation will exceed benefit disbursements, and thus a fund will be built up; after the early years (or perhaps decades) of operation the reverse situation will occur. If the system is in "actuarial balance," with the level contribution rate properly and precisely determined, interest on the fund developed in the early years will meet the excess of benefit disbursements over contribution income in the later years.

As an alternative to financing a pension plan with a level contribution rate, a schedule providing for a lower rate in the early years and a series of increases thereafter can be used. The

[1] See Robert J. Myers, "Long-Range Trends in Old-Age Assistance," *Social Security Bulletin*, February 1953.

[2] For data showing the actual operations of the trust fund in each of the calendar years 1940–52, see the *Bulletin*, March 1953, p. 28.

[3] Sometimes the word "reserve" is used to designate the developing fund under a pension plan. From a strictly accurate, technical standpoint, "reserve" should be used only to denote an actuarially calculated amount based on actual and estimated benefit and contribution obligations.

ultimate rate under such a schedule will, of course, have to be higher than the level rate mentioned previously. The size of the fund that develops would depend on the gradation of the contribution schedule. If there were very little gradation (that is, if the initial rates were only slightly below the level rate, and the ultimate rate was attained in a short period and was accordingly very little above the level rate), then the developing fund would be almost as large as under the level-rate basis. At the other extreme, if the contribution schedule started out very low and rose very slowly but ultimately, of course, to a fairly high level, virtually no fund might be developed, and yet the system would be in actuarial balance.

In fact, this situation—in which the contributions are determined, to all intents and purposes, so that they equal the estimated benefit payments in each future year—is actually one form of "pay-as-you-go" financing. The term also applies to a situation that involves no definite benefit commitments but instead the paying of whatever benefits would be possible with the prescribed contribution income, or conversely raising whatever money would be necessary to meet benefit obligations determined in advance.

There are, of course, an infinite number of variations possible in the contribution schedule that, under the assumptions made, would result in a self-supporting system.

As still another alternative, plans can be financed by having higher contribution rates in the early years and lower ones thereafter. This procedure, naturally, produces a larger fund than financing through the use of level rates and is fairly common in financing private pension plans. The accrued liability for service performed before the inception of the plan and the additional cost arising from the fact that the initial group is older than future new entrants can both be financed by amortizing them over a period of years.[4] After this time, the contribution rate would be relatively

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[4] In theory, these liabilities could be paid off in one initial lump sum, but in practice this procedure is not followed, if for no other reason than tax considerations.

low—at the level necessary for new entrants coming in at the younger ages. Furthermore, at such time the system would be fully funded and meet the most rigid definition of actuarial soundness (to be discussed in some detail later). Thus the assets on hand would be sufficient to meet all the benefit obligations that have accrued, even if the system were to be abandoned both as to collection of contributions in the future and crediting of future service.

It may be noted further that if, by reason of the provisions of the plan established, the cost of the benefits does not rise sharply in the future, the resulting fund, even with a level contribution rate, will be much smaller than under a plan that has a sharply rising benefit cost. In fact, if a plan is developed in which the benefit cost (related to payroll) would be the same for every future year, then obviously the corresponding level contribution rate would just meet the benefit disbursements each year, and no fund would develop.

One disadvantage of having an increasing contribution rate is that those who retire in the early years of operation do not pay as high a rate for the benefits they receive as do those who retire in subsequent years. Even with a level contribution rate, those who retire in the early years usually receive far more in benefits than their contributions would have purchased on an actuarial basis, since through one method or another they receive credit for service performed before the inception of the plan, and accordingly only a small portion of their benefit is "purchased" by their contributions. This procedure is customary under both private pension plans and social insurance. Otherwise, if benefits paid are related to contributions made, inadequate benefits would be provided for the first few decades of the operation of the system, and accordingly the program would not really be serving the purpose for which it was established.

Another problem arising with an increasing contribution rate is that ultimately rates must be higher than individual equity would suggest—that is, the young entrant would be able to purchase more protection with his own employee contributions from a

private insurance company than is furnished under the social insurance system. If this situation were to arise, one possible solution would be to lower the ultimate contribution rates and make up the difference by a Government subsidy to the system in the later years of operation. On this basis, there could be a graded contribution rate starting at a low level and not rising beyond the "individual equity" level; at the same time a relatively small fund would be built up. This solution would involve the concept of an ultimate Government contribution or subsidy.

Concept of Actuarial Soundness

In discussions of any type of long-range benefit program, the phrases "actuarial soundness" or "actuarially sound" occur from time to time. Essentially, these terms relate to the ability of the given plan to provide the benefits established. Many different definitions may be given in the absence of any strict legal requirements applicable (as, for instance, in the case of reserve requirements for life insurance and annuity reserves of private insurance companies). When noninsured pension plans are being considered, there tends to be a somewhat broader range of definitions. For Government social insurance plans the range is even broader.

At perhaps one extreme might be a definition that a plan is actuarially sound if the fund on hand is large enough to pay all future benefits for those currently on the roll—in other words, without any allowance for the accrued benefit rights of those not yet retired. At the other extreme might be a plan under which the existing fund was sufficient to pay for all benefit rights accrued to date. This basis would be somewhat difficult to attain for a newly organized plan that assumed considerable liabilities on account of past service. Accordingly, some actuaries define an actuarially sound plan as one "where the employer is well informed as to the future cost potential and arranges for meeting those costs through a trust or insured fund on a scientific, orderly program of funding under which, should the plan terminate at any time, the then pensioners would be secure in their pensions and the

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then active employees would find an equity in the fund assets reasonably commensurate with their accrued pensions for service from the plan's inception up to the date of termination of plan."[5] This definition permits a long period before all the past-service credits are fully funded.

Other actuaries have a somewhat less stringent definition of an actuarially sound system: "one which sets forth a plan of benefits and the contributions to provide these benefits, so related that the amount of the present and contingent liabilities of the plan as actuarially computed as of any date will at least be balanced by the amount of the present and contingent assets of the plan actuarially computed as of the same date."[6]

How do these concepts of actuarial soundness apply to the old-age and survivors insurance system? According to the first definition, this program is not actuarially sound; according to the second definition, it is. Acceptance of the basis of the first definition, however, does not mean that the converse is true—that the old-age and survivors insurance system is actuarially unsound and therefore by implication is bankrupt and should be liquidated. Rather, the author of the first definition stated that he did not "see any point in rigorously applying actuarial reserve techniques to a broad national system. Such a system transcends 'actuarial soundness' criteria of the usual kind. What purpose would be served if reserve assets in the actuarial amount of $150 billion were now on hand? They would not be used; the system is not going to terminate, calling on a liquidation of the reserve for benefits."

Finally, the question may be examined as to whether a long-range

[5] Dorrance C. Bronson, "Pension Plans —The Concept of Actuarial Soundness," *Proceedings of Panel Meeting, "What is Actuarial Soundness in a Pension Plan,"* sponsored jointly by the American Statistical Association, American Economic Association, American Association of University Teachers of Insurance, and Industrial Relations Research Association, Chicago, Dec. 29, 1952.

[6] George B. Buck, "Actuarial Soundness in Trusteed and Governmental Retirement Plans," ibid.

social insurance system with "pay-as-you-go" financing (defined to mean that annual receipts and annual disbursements are approximately in balance) could ever be considered actuarially sound. It could not, of course, under the first definition of actuarial soundness. Under the second definition, however, it would be possible that such a program could be actuarially sound if the contribution schedule, rising in the future, would be determined so as to closely approximate the estimated future benefit disbursements year by year.

Regardless of whether the concept of actuarial soundness in its usual meaning can be applied to the old-age and survivors insurance system, there must be thorough actuarial analysis and cost estimates for the program—essential factors in considering and determining the long-range benefit structure of the program.

Investment Procedures

Throughout the entire period of operation of the old-age and survivors insurance program, the method of investing the trust fund has changed relatively little. In general, it may be said that the trust fund, which is under the direction of the Secretary of the Treasury, receives the contribution income and pays out the benefits and administrative expenses. The excess of the income over the outgo is invested in Federal Government bonds, and the interest therefrom further augments the income of the fund.

The investments can be either in special issues or in any other securities of the Federal Government, bought either on the open market or at issue. In the past some regular issues have been bought, both on the open market and when they were offered to the general public. Most of the investments, however, have been in special issues. Before 1940, it was provided that these special issues should bear an interest rate of 3 percent, but subsequently they have carried an interest rate slightly below the average rate on all interest-bearing obligations of the United States. At one time in the past the rate on special issues was as low as 1⅛ percent, but for issues after June 1951, it was 2¼ percent, and for issues

after February 1953, 2⅜ percent.

Although there has been considerable opposition to investing the excess income of the system in Government bonds, no positive support has been offered for any other form of investment. All other possibilities have seemed to be objectionable for overwhelming reasons.

One possible investment practice would be to purchase securities of private concerns, either bonds or equity shares. There are several objections to this approach. First, with the large amount of money available, the Government would control a considerable portion of the private industrial economy, which would, in effect, result in "socialism by the backdoor method." Another practical disadvantage would be the need for a far-reaching and deep-searching investment policy that would permit the fund to obtain an adequate rate of interest with reasonable security. Under such a policy the Government would in effect be setting itself up as a rating organization, since the investment procedures would naturally have to be open to full public view. If no preference were shown for different types of securities, but rather investments were made widely and indiscriminately, there would be a serious danger of loss of capital and diminution of investment income.

Another possible procedure would be to invest the funds in social and economic activities such as the construction of housing, dams, hospitals, and the like. This method would be open to some objection on the grounds mentioned previously—Government entry into private fields of activity. Even more serious is the argument that any use of public funds for such purposes should be under the control of the elected representatives of the people (Congress) rather than indirectly by having a social insurance organization making decisions as to what is best for the country. Investment of the funds in either public or private securities of foreign countries would, of course, be impractical and undesirable.

Criticism of the Trust Fund's Validity

The trust fund, which has developed from the excess of income

over outgo, has been subject to criticism on two entirely different bases; first, as to the actuarial and economic desirability and necessity of having such a fund, and second, as to whether such a fund possesses any validity and significance. Throughout the entire period of the program's operation, there has been active discussion on these matters.

It has been argued that the resulting fund is not valid because the money invested in Government bonds has been spent for other than social security purposes. According to this view, these bonds are mere "scraps of paper" and are worthless, and there will be "double taxation" for social security—first, the old-age and survivors insurance contribution, and second, the tax to redeem the bonds later (or to pay interest on them). This argument has perhaps been the one most frequently used against the trust fund (and its investments), since it appears so simple. Those who disagree with the argument do not thereby necessarily express themselves as being in favor of large reserves.

The bonds held by the trust fund are just as valid as United States Government bonds held by insurance companies, banks, and other private investors. There is no basis for the "double taxation for social security" argument, since the taxes for the redemption of the bonds in the trust fund (or for paying interest on them) would have to be collected no matter who held the bonds. Furthermore, it is quite likely that there will never be any necessity for calling for redemption a large portion of the fund.

The validity of the trust fund would be open to serious question in one situation—if there were no public debt and the fund were given interest-bearing obligations while the moneys were held idle in the general treasury. Under present circumstances this situation is not likely to occur, at least in the near future.

An able and clear discussion of the fallacies in the argument that the trust fund is not valid was given by M. A. Linton, Chairman of the Board of the Provident Mutual Life Insurance Company and a member of the 1937 and 1947 Advisory Councils on Social Security, in a paper given before the Thirteenth International Congress of Actuaries, in June 1951, when he stated:

Consider first the situation when the Government is compelled to borrow as in time of war. It is then clear that the borrowing of excess Social Security income is as desirable as borrowing from any other source; and more desirable than borrowing from the commercial banks which involves a corresponding inflationary increase in bank deposits. The bonds in the hands of the trustees of the Trust Fund are on a par with the Government bonds bought, for example, by the life insurance companies. No one has as yet seriously contended that their bonds are not valid because the money has been spent by the Government.

In times when the Government does not have to borrow, then the proper use of the borrowed Social Security funds is to reduce publicly held Government debt. This in effect transfers such publicly held debt to the Trust Fund. This occurred during years following the war when the Federal budget was in balance. The bonds in the Trust Fund thus acquired are as valid as any other Government bonds and cannot be said to have come into being in a way to damage the economy.

Perhaps the clearest way to show the error in the [double taxation] charge is to consider a concrete example. Suppose the Trust Fund consists of $10,000 million of Government bonds bearing an average interest rate of 2%. The annual interest charge is therefore $200 million. To provide this interest, $200 million of taxes must be levied on general taxpayers. Had the $10,000 million of bonds been in the hands of the public, the $200 million would have been paid to public holders. But since the bonds are in the trust fund the $200 million are paid to the Fund thereby relieving the Social Security system of levying $200 million of payroll or other taxes.

Therefore the dollars of taxes raised to pay the interest on the bonds in the Trust Fund are 'double duty' dollars, serving two purposes. First, they pay interest that would have to be paid in any event, whoever held the bonds, and second, they relieve Social Security or other taxpayers of an equal burden. A similar statement can be made about taxes raised to meet principal payments on the Trust Fund bonds. Thus it becomes clear that the double taxation argument is not valid.

Need for Trust Fund

Under any social insurance system, it would seem that for practical administrative and legislative purposes there should be at least a small contingency reserve. Although opinions vary somewhat, it is rather generally believed that such a contingency fund should be equal to the benefit payments for at least 1 year. A fund of this type is obviously necessary for administrative reasons—to have a working balance on hand and to meet any fluctuations in contribution income due to cyclical changes in the economic situation.

There is, however, considerable difference of opinion as to whether a large trust fund should be established for a social security program. Any arguments in favor of a large fund must necessarily be predicated on the assumption that economic conditions will be relatively stable. Obviously, from the standpoint of the social insurance system, there would be no point in building up large reserves if they were subsequently to decline in value as a result of inflation. Even under the premise of stable economic conditions, however, there is still considerable difference of opinion.

Two major arguments have been advanced in favor of a large fund. First, such a fund is said to be necessary in order to have "honest accounting," so that both the assets and the liabilities of the system will be fully recognized, and therefore any changes proposed that would be too extravagant can be avoided. Second, this financing method serves to distribute the cost of the program more equitably between present and future generations, since it involves the levying of a higher contribution rate in the early years than is needed for the current benefit disbursements. Interest on such a fund will help to meet the heavy load of benefit payments in the future when the system becomes mature. Accordingly, at that time, a lower contribution rate can be levied than would otherwise be possible if no fund were built up.

There are several major arguments against the accumulation of reserves. First, the existence of a large fund

might be widely misunderstood by the general public, who might feel that the fund represents a "surplus" that can be used to pay benefits on a scale that eventually would prove too costly. In actuality, a large fund, whether in a social insurance system or in a private insurance organization, does not necessarily mean that there is a surplus, or excess of assets over actuarial and other liabilities. Second, the existence of a large fund with considerable excess of income over outgo might encourage unwise Government spending because of the ready availability of the money. Third, the withdrawal of money from the national economy through payroll taxation, and its investment in Government bonds, might have deflationary effects, which at some stages of the business cycle might be desirable but at other times could prove rather serious in bringing on, or prolonging, a depression. Fourth, a large accumulation of funds means that the current generation, in effect, contributes a substantial share of the cost of benefits for those who retire in the early years. Such contributions, made in the form of payroll taxes, might be more regressive than general revenues.

In any event, whether a large fund or only a contingency fund is favored, the financing basis to be adopted is secondary; primary consideration must be given to the benefit and coverage structure. Certainly, the financing method should not serve as a "straitjacket" on the benefit and coverage provisions. Much of the fund "problem" can be mitigated if benefit and coverage provisions are adopted that bring the program as near maturity as possible—if, in other words, from its inception (or later modification) the system pays benefits to as large a group as would have been on the rolls if the system had been in effect for many years.

Actuarial Basis of the 1935 Act

In 1935 the Committee on Economic Security, appointed by the President in 1934, had recommended what was, in effect, a contingency fund (amounting ultimately to about $15 billion). This fund would be developed under a graded tax schedule, providing for a rise from a combined rate of 1 percent of payroll for the first 5 years to an ultimate rate of 5 percent after 20 years (the contribution to be shared equally by employers and employees). Eventually a Federal subsidy would be introduced when the outgo from the fund would otherwise have exceeded income. It was estimated that the Federal contribution would ultimately be about two-thirds as large as the total tax collections from employers and employees.

The legislation enacted, however, did not provide for any Federal contribution. The cost estimates indicated that the system would be self-supporting from the contributions of employers and employees—partly because the benefit structure differed from that in the original recommendations and partly because of the use of a more steeply graded tax schedule. Under the schedule adopted, the combined rate of 2 percent in effect for the first 3 years of operation was to rise to an ultimate rate of 6 percent within 12 years. The system would be self-supporting, according to the estimates, since for the first 30 years the contribution income would exceed benefit outgo and a substantial fund would be built up (amounting eventually to $47 billion); in the later years, when benefit payments would exceed contribution income, the difference would be made up from interest on the fund.

Actuarial Basis of the 1939 Act

In 1937 an advisory council was established by Congress and the Social Security Board to study the old-age benefit system. To finance the program the council recommended the development of only a small contingency fund with eventual Government contributions. It also recommended that more in benefits be paid out in the early years than under the existing program and less later; if the contribution rates were unaltered, the result would be smaller fund accumulations and requirements.

The legislation enacted in 1939 changed the basis of financing to what was believed by some to be a pay-as-you-go basis or, more properly, a "contingency-fund" basis. The shift to this approach was not specifically stated in the law, however, and it is not clear that actual experience has followed this pattern. The law provided that there should be a report whenever the trust fund was estimated to exceed three times the highest annual expenditures expected during the next 5 years, or conversely whenever the fund was unduly small. This "three times" rule gave support to the view that the system was on a contingency-fund basis.

The "three times" ratio was exceeded almost from the very beginning. Perhaps for this reason, among others, legislation was enacted at various times during the 1940's, "freezing" the contributions at a combined rate of 2 percent until 1950, when they were allowed to rise to 3 percent.

The 1939 amendments made no specific provision for any Federal contribution to the trust fund, despite the fact that a contingency-fund approach had apparently been adopted. The 1943 legislation "freezing" the 2-percent tax rate did include, however, a provision authorizing appropriations to the trust fund from general revenues in the amounts necessary to finance the benefit payments. No appropriations have been made or requested under this provision, probably because the trust fund grew rapidly and none seemed to be required.

The original actuarial cost estimates for the 1939 act indicated that the system would not be self-supporting and that eventually a Federal contribution would be necessary. With the rapid increase in wages during World War II, the cost of the system in relation to payroll decreased.[7] As a result, cost estimates made after the war indicated that, according to the tax schedule in the law, the system was then probably on a self-supporting basis. Presumably the tax schedule might be modified in the future by Congress if the trust fund should become so large that it would be in conflict with what was apparently the

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[7] Because of the "weighted" benefit formula, beneficiaries with higher wages receive relatively lower benefits in relation to their wage. Accordingly, as wages rise, the average benefit as a proportion of the average wage becomes lower, and therefore the cost of the program relative to payroll decreases.

financing philosophy of the 1939 legislation.

Actuarial Basis of the 1950 Act

Another Advisory Council on Social Security was established by Congress in 1947 to consider necessary changes in the program. Although primary consideration was given to benefit and coverage changes, the financing problem was also given serious study. It was recommended that the combined tax rate should be increased immediately to 3 percent and that a further increase to 4 percent should be made only when the fund began to show an excess of outgo over income. Eventually, when outgo again would exceed income, a Federal contribution, sufficient in amount to maintain the fund at its size at that time, would be introduced. The Federal contribution was never, however, to be more than half as large as the total contributions from employers, employees, and the self-employed or, in other words, never more than roughly one-third of the disbursements. Accordingly, when this situation would otherwise occur, the contribution rate for employers, employees, and the self-employed should be raised.

In the legislation enacted in 1950, this recommendation of the Advisory Council was not followed; instead Congress expressed its intention that the system should be completely self-supporting, without Federal subsidy. In accordance with this view, the provision for a potential Government contribution, which had been incorporated in the 1943 law, was eliminated. A new graded tax schedule was adopted; from a combined employer-employee rate of 3 percent in 1950–53, the rate was to rise to 6½ percent by 1970.[8]

This tax schedule would, as closely as could be estimated at the time, place the system on a self-supporting basis, with the ultimate size of the trust fund about $100 billion, according to the intermediate-cost esti-

[8] Self-employed persons pay three-fourths of these rates on their covered earnings. For years before 1951 the tax rates applied to the first $3,000 of annual covered earnings, while for years following 1950, this amount was raised to $3,600.

mate.[9] When benefit outgo exceeds contribution income, the difference is to be made up by interest on the fund. Accordingly, it may be seen that the financing basis of the program had essentially completed a full circle and was back at the same point as when the 1935 act was passed. On the basis of past experience, however, it should be realized that Congress may at any time change the financing basis.

Actuarial Basis of the 1952 Act

The tax schedule in the 1950 act was left unchanged by the 1952 amendments, despite the liberalizations in benefits. No change was necessary because, according to the cost estimates, the estimated cost[10] in relation to payroll was not materially changed.

The cost estimates for the 1952 act prepared at the time of its consideration by Congress used the same methodology and assumptions employed in making those for the 1950 act with two exceptions. An interest rate of 2¼ percent instead of 2 percent was used (since interest rates had risen significantly), and the assumptions as to average earnings were about 20 percent higher (corresponding to the 1951 experience, while the previous estimates had been based on 1947 experience). Both of these changes, but especially the latter, result in relatively lower costs (as a proportion of covered payroll). The weighted nature of the benefit formula is such that, as earnings rise, the benefits represent a relatively lower proportion of credited earnings. The reductions in cost were thus utilized to meet the increased cost of the benefit liberalizations.

[9] See "Actuarial Cost Estimates for the Old-Age and Survivors Insurance System as Modified by the Social Security Act Amendments of 1950," prepared for the use of the Committee on Ways and Means by Robert J. Myers, Actuary to the Committee, July 27, 1950.

[10] See "Actuarial Cost Estimates for the Old-Age and Survivors Insurance System as Modified by the Social Security Act Amendments of 1952," prepared for the use of the Committee on Ways and Means by Robert J. Myers, Actuary to the Committee, July 21, 1952.

Accordingly, the financing basis currently in effect is the same as it was under the 1950 act—that is, the system is intended to be completely self-supporting from worker and employer contributions. The ultimate result will be a large interest-earning fund, amounting to slightly more than $100 billion according to the intermediate-cost estimate. (The trust fund was $17.4 billion as of the end of 1952.) For 1953, estimated income will be about $4.3 billion ($3.9 billion in contributions and $0.4 billion in interest), and outgo will amount to $3.1 billion ($3.0 billion in benefits and $0.1 billion in administrative expenses), leaving a net income of $1.2 billion. For 1954, contribution income will be considerably increased (to about $5.1 billion) because the combined employer-employee rate is scheduled to rise from the present 3 percent to 4 percent; benefit disbursements will rise somewhat (to about $3.4 billion). As a result, the net income to the fund in 1954 will be roughly $2.1 billion.[10a]

Relationship With Railroad Retirement System

An important element affecting the financing of the old-age and survivors insurance system arose through amendments made to the Railroad Retirement Act in 1951.[11] The law provides for a coordination of railroad compensation and covered earnings under old-age and survivors insurance in determining not only survivor benefits but also retirement benefits for persons with less than 10 years of railroad service. All future survivor and retirement benefits involving less than 10 years of railroad

[10a] On May 20, 1953, President Eisenhower recommended to Congress that the increase in the contribution rate from 1½ percent to 2 percent, scheduled to go into effect in 1954, should be postponed for 1 year. If this deferment were made, the net income to the fund for 1954 would be about $900 million.

[11] See Robert J. Myers and Wilbur J. Cohen, "Railroad Retirement Act Amendments of 1951: Benefit Provisions and Legislative History," *Social Security Bulletin*, February 1952; and Robert J. Myers, "Railroad Retirement Act Amendments of 1951: Financial and Actuarial Aspects," *Social Security Bulletin*, March 1952.

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service are to be paid by the old-age and survivors insurance system.

The financial interchange provisions are designed to place the old-age and survivors insurance trust fund in the same financial position it would have held if there never had been a separate railroad retirement program. It is estimated by the Social Security Administration that the net effect of these provisions will be a relatively small net gain to the old-age and survivors insurance system, since the reimbursements from the railroad retirement system will be somewhat larger than the net additional benefits paid on the basis of railroad earnings.

The long-range cost estimates currently developed (tables 1 and 2) are for the operation of the trust fund on the basis, as provided in current law, that all railroad employment will be (and always has been) covered employment. The basis of the figures showing the balance in the fund thus corresponds exactly to the procedure that will actually be followed in the future. The contribution income and benefit disbursements shown in the tables are slightly (less than 5 percent) higher than the amounts that will actually be paid directly into the trust fund by contributors and the payments that will actually be made from the trust fund to the individual beneficiaries. This difference occurs because the figures here include both the additional contributions that would have been collected if railroad employment had always been covered and the additional benefits that would have been paid under such circumstances. The balance for these two items is to be accounted for in actual practice by the operation of the financial interchange provisions.

Future Operation of Trust Fund

Cost estimates on an intermediate basis were prepared as a base for the financing provisions of the 1950 and 1952 acts, because a single set of figures is necessary in developing a tax schedule to make the program self-supporting, according to a reasonable estimate. These intermediate-cost estimates, however, were not

Table 1.—*Estimated progress of the old-age and survivors insurance trust fund in selected years, 1960–2000, under high-employment assumptions* [1]

[In millions]

Calendar year	Contributions [2]	Benefit payments	Administrative expenses	Interest [3]	Balance at end of year
Actual data [4]					
1950	$2,671	$961	$61	$257	$13,721
1951	3,367	1,885	81	417 [5]	15,540
1952	3,819	2,194	88	365	17,442
Low-cost estimate					
1960	$6,646	$5,267	$101	$657	$30,482
1970	9,985	7,723	125	1,186	54,982
1980	11,176	10,321	151	1,868	85,263
1990	12,224	12,584	175	2,345	106,282
2000	13,591	13,455	191	2,830	128,565
High-cost estimate					
1960	$6,578	$6,166	$134	$540	$24,673
1970	9,878	8,913	170	741	34,084
1980	10,874	11,9.9	208	915	40,941
1990	11,435	14,725	246	557	23,547
2000	12,191	16,169	268	(6)	(6)
Intermediate-cost estimate [7]					
1960	$6,612	$5,716	$118	$598	$27,578
1970	9,932	8,318	148	964	44,533
1980	11,025	11,116	180	1,392	63,102
1990	11,830	13,656	210	1,451	64,914
2000	12,891	14,812	230	1,265	56,412

[1] The provisions for financial interchange with the railroad retirement system affect the data; for an explanation see p. 9.
[2] Employer, employee, and self-employed. The combined employer-employee rate is 3 percent for 1950–53, 4 percent for 1954–59, 5 percent for 1960–64, 6 percent for 1965–69, and 6½ percent for 1970 and after. The self-employed pay three-fourths of these rates.
[3] Figured at 2¼ percent on average balance in fund during year.
[4] Based on *Daily Statement of the Treasury*. For 1950, benefit payments were made under 1939 act for first 9 months and under 1950 act for last 3 months; for 1952, payments were made under 1950 law for first 9 months and under 1952 law for last 3 months. Contribution income for 1950 collected on coverage and maximum wage base in 1947 law; for later years, on provisions in 1950 law.
[5] Figure inflated because it includes a large part of the interest that accrued in the second half of 1950 and almost all the 1951 interest.
[6] Fund exhausted in 1997.
[7] Based on average dollar costs under the low-cost and high-cost estimates.

intended to represent the "most probable" estimates, since it was believed impossible to develop any such figures. They were, rather, a simple average of the low-cost and high-cost estimates, both based on high-employment assumptions representing close to full employment.

Since the present contribution schedule was established to make old-age and survivors insurance approximately self-supporting, on an intermediate-cost estimate, it could be anticipated that the low-cost estimate should show that the system would be more than self-supporting and that a high-cost estimate would show an eventual deficit. The low-cost estimate made at the time the 1952 legislation was enacted showed a trust fund building up rapidly and becoming very large—almost $225 bil-

lion in the year 2000, when it would be growing at a rate of $5½ billion a year. Under the high-cost estimate, the trust fund would grow more slowly, reaching a maximum of roughly $60 billion in about 30 years and then decreasing until it is exhausted in another 20 years. In actual practice, if the financing basis established in 1950 were followed—that the program should be self-supporting from contributions of employers and workers—the tax schedule or the benefit provisions undoubtedly would be appropriately adjusted at some future date so that neither development would ever eventuate.

Naturally, long-range cost estimates cannot be expected to be precise and unchangeable. As experience develops, these estimates require modification from time to time. Since

Table 2.—Estimated progress of the old-age and survivors insurance trust fund in selected years, 1960-2000, under low-employment assumptions [1]

[In millions]

Calendar year	Contributions [2]	Benefit payments	Administrative expenses	Interest [3]	Balance at end of year
			Actual data [4]		
1950	$2,671	$961	$61	$257	$13,721
1951	3,367	1,885	81	[5] 417	15,540
1952	3,819	2,194	88	365	17,442
			Low-cost estimate		
1960	$5,627	$5,241	$98	$517	$23,651
1970	8,397	7,452	116	727	33,432
1980	9,361	9,686	139	979	44,260
1990	10,164	11,517	160	963	43,228
2000	11,238	12,369	172	839	37,468
			High-cost estimate		
1960	$5,563	$5,835	$125	$431	$19,397
1970	8,324	8,310	158	416	18,847
1980	9,138	10,903	193	298	12,557
1990	9,519	13,373	227	(6)	(6)
2000	10,082	14,811	246	(6)	(6)
			Intermediate-cost estimate [7]		
1960	$5,595	$5,537	$112	$474	$21,524
1970	8,361	7,881	137	572	26,140
1980	9,250	10,294	166	638	28,408
1990	9,842	12,443	194	298	12,124
2000	10,660	13,588	209	(8)	(8)

[1] The provisions for financial interchange with the railroad retirement system affect the data; for an explanation see p. 9.

[2] Employer, employee, and self-employed. The combined employer-employee rate is 3 percent for 1950-53, 4 percent for 1954-59, 5 percent for 1960-64, 6 percent for 1965-69, and 6½ percent for 1970 and after. The self-employed pay three-fourths of these rates.

[3] Figured at 2¼ percent on average balance in fund during year.

[4] Based on Daily Statement of the Treasury. For 1950, benefit payments were made under 1939 act for first 9 months and under 1950 act for last 3 months; for 1952, payments were made under 1950 law for first 9 months and under 1952 law for last 3 months. Contribution income for 1950 collected on coverage and maximum wage base in 1947 law; for later years, on provisions in 1950 law.

[5] Figure inflated because it includes a large part of the interest that accrued in the second half of 1950 and almost all the 1951 interest.

[6] Fund exhausted in 1986.

[7] Based on average dollar costs under the low-cost and high-cost estimates.

[8] Fund exhausted in 1995.

the congressional action on the 1952 amendments, new cost estimates have been developed to take into account further actuarial and statistical data available from program operations and from the 1950 Census.[12] Estimates have been made on the assumption of low-employment and high-employment conditions as well as on the basis of low-cost and high-cost factors (tables 1 and 2).

The level-premium costs[13] (as a

[12] For the estimates and a general description of their underlying assumptions see the Thirteenth Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance Trust Fund; they will be given in more detail in a forthcoming study by the Division of the Actuary.

[13] For benefit payments after 1952; takes into account the trust fund at the beginning of the period and future administrative expenses.

percentage of covered payroll) based on 2¼-percent interest for the new estimates are as follows:

Estimate	Level-premium cost based on assumption of—	
	Low employment	High employment
Low-cost	6.34	5.69
Intermediate-cost	7.28	6.58
High-cost	8.37	7.63

The graded contribution schedule in the law is roughly equivalent to 6 percent of payroll. Accordingly, all estimates except that based on the low-cost, high-employment assumptions indicate that the system is not self-supporting. This situation, however, would be considerably altered if a higher interest rate had been used. Currently the interest rate is rising

rapidly. If, for example, a rate of 2¾ percent were assumed, the level-premium cost based on intermediate-cost, high-employment assumptions would be 6.22 percent and the system would be nearly self-supporting.

On the whole, the new estimates indicate a somewhat higher cost than the previous ones. Except in the low-cost, high-employment estimate, the trust fund reaches a maximum and then decreases significantly, rather than leveling off as it would if it were on an exactly self-supporting basis.

The variability of the cost estimates made at different times poses an important question as to the possibility of determining a precise contribution schedule to make the system exactly self-supporting. In general, however, the estimates clearly indicate that there will be rising costs for many years and at the same time show the general magnitude of the trend at alternate levels.

Effect of Maturity on Financing

It is clear that the financing problems of any system providing old-age benefits are simplified when the program becomes mature. There are really two stages of maturity. The first occurs when all persons over age 65 have had an opportunity to be in covered employment during their entire working lifetime (or else, through some means, are given prior-service credit). The second stage occurs necessarily much later—when the aged population of the country ceases to represent an increasing proportion of the total population.

The first stage of maturity can, by various means, be attained or approached currently. Under old-age and survivors insurance, for example, all the uninsured aged could be "blanketed in" so that they would receive at least the minimum benefit. Under such a proposal, this type of maturity would be partly attained immediately but would not be fully attained until some years hence, when all individuals had had an opportunity to obtain more than the minimum benefit. The second type of maturity, of course, cannot be reached for many decades. Even with a blanketing-in of the current aged, benefit outgo relative to payroll will

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rise in the future, but the rate of increase would be much lower under a blanketing-in proposal than under the present program.

If coverage were extended to all or substantially all gainful employment, the reduction in the cost of the program in relation to payroll would meet part, or perhaps even all, of the long-range, over-all cost (on a level-premium basis) of the blanketing-in provisions.[14] Under a combination proposal for both extension of

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[14] If coverage is broadened, the cost of the program relative to payroll decreases for two reasons. First, all earnings, subsequent to coverage extension, of all individuals are covered so that some persons do not receive high benefits relative to covered earnings through being in covered employment only part of their working lifetime. Under the benefit computation provisions, the average wage is determined

coverage and blanketing in, the cost relative to taxable payroll would be raised in the early years and lowered in the later years. The rate of increase of benefit cost would therefore be smaller, and, as indicated previously, the financing problems of fund accumulations would be lessened.

Conclusion

This article has traced the development of the actuarial financing basis of the old-age and survivors insurance

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over the entire potential working lifetime, and the benefit is determined by a weighted benefit formula. Accordingly, a reduction in the average wage because of noncovered periods produces less than a proportional reduction in benefits. Second, the broader application of the work clause, or retirement test, prevents the payment of "retirement" benefits to persons who are actively engaged in gainful employment.

system in the United States. A substantial trust fund has been built up, which under present provisions will continue to grow—at least in the near future. No definite, final policy has been adopted as to the financing basis of the program. Congress, when it last considered the question, in 1949 and 1950,[15] seemed to favor a self-supporting system with a relatively large trust fund developing over the years. It is impossible to predict what course of action will be taken in the future as to the financing of the program, since this is a matter inherently linked not only with possible changes in the nature and scope of the program but also with the state of the national economy.

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[15] The 1952 amendments were enacted without full consideration of all aspects of the program because extensive hearings on the subject and executive committee sessions had been held just 2 years earlier.