COST FACTORS IN OLD-AGE INSURANCE

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The old-age insurance program established by the Social Security Act seems to follow in certain aspects the underlying principles of life and annuity insurance as developed under the auspices of private insurance companies. It should therefore be of interest to compare the actuarial processes of cost analyses in private insurance with those applicable to the Federal old-age insurance program and to point out certain differences between private and social insurance. Factors applying to future costs that are to a large degree measurable in the former are more hypothetical in the latter, subject as they are to a heavier weighting of future benefits and to the changing trends of social objectives and economic forces.

The actuary, in private life insurance, is assumed to understand the mathematical relationships of the business. In particular, he must be largely responsible for the determination of adequate premium rates for the benefits proffered. Ordinary insurance in the United States has commonly stressed more dramatically the benefits payable in event of death than the supplemental benefits payable because of continued life, and the insurance company's sense of responsibility is evidenced by the use of mortality tables which provide for more than the "most probable" number of deaths. There is now an increasing emphasis on annuities, or benefits to the living. The conservative mortality tables, developed for life insurance, are not conservative when applied to annuities. Equally conservative practice would require mortality tables for annuitants to indicate fewer deaths than are expected. This would provide a safe margin for contingencies and inadequacies in the estimates of factors governing costs.

The level-premium life insurance business has developed four distinct elements into which the individual premium of any single year can be broken: (1) contribution to the probable death losses of the year; (2) contribution to the year's expenses of administration; (3) the year's contribution to the reserve developed to supplement the later premiums when, since death rates steadily increase with age, the whole annual premium alone might be inadequate to meet the full costs of protection (this can be called the banking or savings element); (4) the year's margin earmarked for the contingencies of the business, for some return to capital in stock companies, and, in participating insurance, for the payment of dividends or a share of the surplus to policyholders (for early policy years this margin may be negative).

Rules have been developed to determine, as a safeguard to policyholders, the required legal reserve for private insurance companies, based upon the best available standards recognized by State legislatures and supervising insurance departments.

The main duty of the actuary may be said to center upon a full understanding of the other three elements—death losses, administrative expenses, and margins. He must recognize the changing death rates. He must know with some degree of adequacy how the overhead expenses of the business will develop and how they are to be assessed against fairly rigid gross insurance premiums. He must know within reasonable limits such factors as the probable relationship between new business and renewals, and what real financial progress may be expected from a growing volume of business.

Since the primary source of income is the sum total of the premiums, which must be adequate for all these demands, the most important factor is an understanding of the proper handling of the "contingency" margin. The actuary must know the general trends of mortality, interest rates, average size of policy, costs of clerical and selling labor, special problems posed by the fact that the medical examination is a safeguard mainly for a short period after the examination, and other less obvious sources of loss or gain. He must learn to recognize the proportion of this margin which may wisely be allotted year by year as dividends to policyholders (and in stock companies to stockholders); the proportion which may be regarded as a sound provision for special known cost elements, left uncovered by the legal reserve standards; and the residue for true "contingencies," such as an epidemic, excess war mortality, or catastrophic economic conditions.

When the provision for death benefits is by far the major portion of the insurance company's business, a single mortality table, such as those specified by insurance departments for life insur-

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ance, might be used, in the interests of simplicity of supervision, to evidence all expected mortality. When, however, provision for annuity payments predominates, the table adopted for annuity valuation should be differently constructed. Other mortality tables, largely based on past experience and especially designed for annuities, have been used for annuity valuations. A forecast table, anticipating further improvement in mortality among future annuitants, would be desirable for a company writing annuities alone. Alternatively, in such a situation a wide margin for contingencies should be included in the gross rates, and the legal reserves should be supplemented by contingency reserves.

Mortality tables are rather technical affairs. While they have been much used by laymen, a thorough comprehension of their exact meaning is extremely rare. Even when they are quoted by insurance companies, it is rather exceptional for a clear statement to indicate that the company *does not expect* the past experience upon which they are based to be reproduced with any exactness in the future. Yet the ordinary insurance business is so important that such statements should be understood.

The direction of private insurance companies requires competent supervision to resolve the conflict between provision for complete and permanent company safety on the one hand and low net costs to policyholders on the other. Important also is the size of reserves for contingencies to allow for new trends which develop and to supplement the requirements of the legal valuation standards. The legal valuation standards are broad and basic; the individual company needs a closer scrutiny of its own liabilities.

The actuary's knowledge of premium rates, reserves, contract forms, must be supplemented by an understanding of the six following factors: (1) the method of selection of the entrants into insurance coverage for the purpose of eliminating the most hazardous risks; (2) the technique of effective salesmanship which brings in "new blood" at a reasonable rate in order to maintain a considerable proportion of the business in force within the period of low mortality following medical and underwriting selection; (3) the presumptive rate of growth of the company and such policy persistency as will balance the high first-year expenses by an adequate volume of lower renewal expenses; (4) the trends of such variables as mortality, persistency, interest rates, insofar as they affect costs and solvency; (5) the modification of premium rates for new entrants and the adoption of a new dividend scale whenever the general conditions of the business make such modification desirable; (6) the control of future commitments by properly drawn policy provisions.

The distinctions between social insurance and private life insurance as developed in the United States are numerous. Private life insurance lacks the ability to force new applicants to join its ranks. Social insurance lacks the selective control over the entrants into the coverage which private insurance exercises by the privilege of rejection. Social insurance may not discard arbitrarily, by the methods of individual selection, those risks which will presumably increase claim rates. It emphasizes to a greater extent benefits to the living rather than benefits following death. Social insurance commonly reserves under national policy the right to change contribution rates and benefit rates, both for future entrants and for those already covered. It need not initially determine rates of contribution which are to hold for the entire duration of individual coverage, and it cannot determine them in perpetuity.

Social insurance thus functions because large groups of the citizens seem in need of a program to furnish certain benefits. Coverage is determined by law; it follows a formula. Under broad definitions, rules and regulations determine when old-age income shall be granted. Should increased rates of tax or contribution be necessary in the future, they must be determined by changes in the law, unless the law specifically grants such latitude. Only the *existing* coverage of the private insurance company enters into current rates and valuation. Its current coverage will diminish steadily because of the joint effects of death, maturity, expiry, lapse, and surrender. The "rate determination" and "valuation" of social insurance involve not only all the survivors of current coverage but all additional risks covered later. The weighting of *future* coverage is therefore so much greater in the actuarial consideration of social old-age insurance than in life insurance as to make the process of valuation much less dependable. Nevertheless, those responsible for administration of the old-age insurance program must survey initially, and periodically thereafter, the actuarial and social principles and operation of the system.

COSTS—WHAT LIES BACK OF THE ESTIMATES

The Committee on Economic Security made crude estimates of the costs of the Federal old-age benefits program running to the year 1980, and of the anticipated trends of congressional appropriations and benefit payments. Estimates of the cost of prospective benefits involve many indeterminate factors. After social insurance is established by law, a long period of time is required for the development of adequate factual information to determine the general reasonableness of any estimates. Since under the Social Security Act ultimate benefits are determined by defined earnings over a period of time beginning January 1, 1937, the extent of the prospective benefits under the coverage is dependent on the amount of such earnings, and the amount of earnings fluctuates under many influences. Even though the prospective benefits determined by wages are evidenced to a large extent by established records, the failure to establish such records may not necessarily result in the denial of coverage to those for whom they have not been established. The legal determination of the fact and extent of coverage will presumably prevail over the preliminary statistical determination evidenced by the records.

In the following discussion certain factors pertinent to any such cost analysis are listed. Studies under all these captions must be initiated and carried through for a preliminary evaluation of the financial aspects of old-age benefits under the Social Security Act. The credence which such studies deserve is still limited. Census material pertinent to these studies has not been developed for the purposes of the act. Such material is not readily adaptable to the problems at hand, and arbitrary adjustments introduce potential errors. The census deals with a population which, over long periods of time and in many areas, has been somewhat careless in the reporting of such facts as dates of birth and death and periodic statements as to age. Employment precisely in keeping with the definitions of the act was not defined in former census reports. Ages of immigrants and emigrants are not easily ascertained. When population growth between censuses has been exceptional in some respect, the situation is difficult to explain, save by using a balancing factor, net migration.

In connection with the initiation of the Social Security Act, it was estimated that the annual covered pay roll for 1937 would be in the neighborhood of $28 billion, representing between 25 million and 26 million full-time jobs held by those initially covered, and additional workers as they qualified by engaging in covered gainful employment. There is as yet no clear evidence of the exact number of covered workers or approximate full-time jobs, though nearly 40 million benefit account numbers have been assigned and it is estimated that wage reports received for the first 6 months of 1937 represent 32 million persons for whom tax payments were made by employers liable to taxation under title VIII of the act. Within the next year there should become available considerable data with respect to employees whose employers have complied with the tax requirements of title VIII and have reported wages as a basis for such tax payment.

There is doubtless some degree of noncompliance or delay in the payment of taxes, and certainly some employers are awaiting legal or administrative decision on whether or not they and their employees are liable to the title VIII tax of the Social Security Act. The total tax receipts during the year 1937 seemed to fall somewhat below the amount anticipated in the early estimates. To what extent this implies that the aggregate wages of covered employees are less than those so roughly anticipated or that noncompliance is more general cannot yet be known.

There is a recognized lag in tax collection. Even though such employment changes as are now developed were accurately recorded, one can hardly believe that the tempo of the period of 1937 and 1938 is indicative of the situation during succeeding decades.

RELATIVELY MEASURABLE FACTORS

Six major factors are involved in measuring the prospective costs of the Federal old-age benefits program, each of which will require careful analysis of vital and occupational statistics, mortality, wage rates, work habits and opportunities, and other economic and social trends in the United States. Granting that the coverage, benefits formula, and financial principles prescribed in the Social Security Act for old-age insurance remain static, the areas thus bounded have a constantly varying content. This content varies with chang-

ing birth and mortality rates, and with various economic and social trends. Under the headings of coverage, survival, continued work after 65, migration, industrial and technical development, and operating expenses are outlined the component parts which enter into these six factors susceptible to some cost measurement. It is patent that the effect of war, booms, and depressions on these various factors is unpredictable.

Coverage and Wage Credits

The determination of coverage, the distinction between the "ins" and the "outs," measurement of present coverage by reported and estimated wage credits, and estimates of prospective coverage and wage returns are first steps in a preview of costs.

Present Coverage

Age.—The Social Security Act excludes from Federal old-age benefits all individuals who were 65 years of age or over on January 1, 1937. Those who were from 61 to 64 on that date had limited coverage, to the extent that their wages from covered employment entitle them to lump-sum payments at age 65 or a death payment to their relatives or estates if they die before age 65.

Workers less than 61 years of age (with no minimum) on January 1, 1937, are potentially eligible for the benefits of the program—monthly retirement benefits or a lump-sum payment at age 65, depending on eligibility; a death payment before age 65, or an adjusted death payment after age 65. In using figures for age distribution of workers in estimates of coverage it must be remembered that some doubt as to exact age is inescapable, both in much of the census data and in employers' records. Age also influences the earning power of workers and affects the basis for age distribution of earnings.

Employment.—The provisions of the Social Security Act exclude from coverage all self-employment; work as an employer or member of a partnership; employment in agriculture; domestic service in a private home; casual labor not in the course of the employer's trade or business; work as officer or member of the crew of vessels; government employment—Federal, State, or local—and employment for governmental instrumentalities; service for certain educational, scientific, religious, or philanthropic organizations. Railroad employees and certain other groups are also excluded from coverage under the Social Security Act by a provision of the Railroad Retirement Act. Substantially all other paid work performed within the United States is covered, beginning January 1, 1937, except when performed after the age of 65.

The fact of employment has been tabulated in certain census material. Since the census treats employment data in the aggregate without reference to the specific requirements of the Social Security Act, census figures require considerable revision to adapt them to those requirements. It is to be hoped that the 1940 census will meet social security needs more directly. There will gradually be developed records of employment as a result of wage reports filed in connection with tax payments under title VIII. Exact limits of the employment periods are not therein stated.

Wage Receipts.—Reports are required of employers liable to taxation under the Social Security Act, showing the total amount of tax payments and indicating the individual wages on which the taxes are based. These reports in turn serve for the accumulation of wage credits for all types of Federal old-age benefits. Subject to previously stated limitations, these accumulated wage receipts will eventually furnish data pertinent to the estimates of probable benefit payments. They will doubtless show significant changes in wage rates over the years.

It seems probable that employees who change employment frequently or who work for employers lacking adequate cost-accounting machinery may question the tabulated earnings credited to them by employer reports. They may, at least at the time of claim for payment, bring in evidence to substantiate additional wage credits. Some effort might well be expended, possibly every 5 years, to obtain employee acceptance of the accuracy of recorded wage credits, limiting such wage-record adjustment to a relatively short period.

Since the old-age benefits program in a sense parallels the coverage and records of unemployment compensation and other programs, similarly based upon wages, some coordination between the different social insurances may develop certain additional checks upon earnings reports. Such records are not yet available in any comprehensive form.

Prospective Coverage

At least during these early years of operation, estimates of ultimate costs will depend to a greater extent upon problematic future earnings than upon past tabulated earnings. The discussion above has been limited to the consideration of information available on existing coverage. So far the available records are still very limited. Over the last 50 years the general trend of dollar wages has been upward. Many jobs in recent years have paid some three times what they would apparently have paid in 1890. Many jobs of the present day have no prototypes in the 1890 industrial scene. This upward trend was one of Sweden's concerns when revamping her pension plan recently. Is it reasonable to assume that we are ready to abandon the struggle for more dollars per annum per capita and instead to attempt to increase their purchasing power? Prospective earnings and the addition of increased numbers of workers to those now covered will depend upon many factors, whose advance measurement can be but crude at best.

Earning Power.- All the elements that go into the determination of earning power, such as age, sex, race, education, industry, occupation, are factors which must be considered in estimating potential future earnings. Steadiness of employment and wage rates, linking future to past earnings, must be considered on the basis of the best available evidence. Whatever arbitrary reasoning is adopted, the margin of error will probably be large.

The influence of the employment service and of unemployment compensation agencies, policies established by employers and labor unions, and other similar community attitudes, might result in either lower or higher dollar rates of pay over periods of time for a large number of people. So high a standard of wage rates might conceivably be maintained as to bar many semicompetent workers from regular jobs. This tendency would require supplementary programs of straight relief for the least competent workers or of work relief at a low wage scale for others.

Many people are now unable to work because of inadequate physical ability; others because of a long period of out-of-work status and a possible lack of mental adaptability under such circumstances. The extent and effectiveness of vocational rehabilitation, both from the standpoint of physical and mental health and training for specific types of gainful employment, are forces which should have a marked effect upon the work relationships of the future.

The Movements Between Covered and Noncovered Employment.—The wide shifts of employment opportunities resulting from radical changes in agriculture, commerce, industry, governmental supervision, and so forth, indicate very large prospective transfers in the future, as in the past, from one type of employment to another. Some evidence of this movement will accumulate from the old-age insurance wage records. Other evidence must be drawn from a census of employment and from such data as have been and will continue to be accumulated in the Bureau of Labor Statistics and other statistical agencies. These transfers, added to other forces, may well double initial coverage within a quarter century, largely increasing the financial requirements of later benefits. Estimates of coverage, effective by 1980, have been made, ranging from 35 million to 75 million.

The existence of the Social Security Act may possibly enhance the attractiveness of certain types of jobs to married women and even to the previously self-employed. Even without additional work opportunities, a very large number of people may perform intermittent work sufficient in amount to qualify them for the minimum monthly old-age benefit of $10. Such work would have the same effect in increasing cost as transfers of workers from noncovered to covered employment, for both emphasize the chance of short-term employment, which has a high weighting in the old-age benefit formula.

Changes in Definitions and Boundaries.—It seems probable that many administrative and legislative changes may affect cost estimates. For example, many of the present boundaries between covered and noncovered employment may be shifted. The chance may be lessened that wages from several different jobs in the same year may greatly increase the size of lump-sum benefits and death payments. The limits in the three-term formula of benefits may be changed so that a different relationship may exist in the future between credited wages and benefit scales. These or similar changes may also affect the minimum age at which benefits are paid and the very attitude towards work after payments have begun. Even as the practical insurance actuary must remain in close touch with changing trends in his own business,

so must the administration of social insurance recognize not merely the possibility but the virtual certainty of such modifications.

Probabilities of Survival

Most established mortality tables furnish inadequate indications of the probability of surviving. They are commonly constructed from the experience at all attained ages over a very brief period of time. The death rates among men of 80, for example, represent the death rates among survivors from the exigencies of life over the previous 80 years. The death rates among infants in a recent table are almost entirely the result of very modern conditions. Such tables fail to represent what we *expect* will be the future mortality among those who will be respectively 80, 60, and 0 years of age in such a far-off time as 1980.

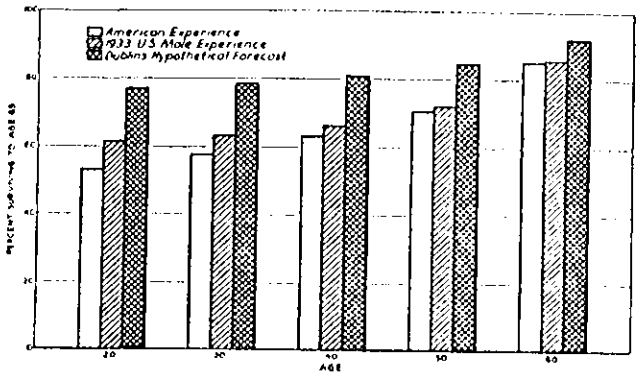
Survival to Age 65

Chances of survival have been set down at quinquennial ages from 15 to 60 to indicate what, according to certain tables selected, are the so-called "expected probabilities" of reaching age 65. The United States life tables of 1900–02 show that of 1,000 persons aged 20, 514 will "probably" survive to age 65, while the table for 1933 shows that 614 will reach age 65, and the hypothetical table, that 769 will attain that age. In this range there is a difference of nearly 50 percent of the lowest "probability." At age 45 the respective ratios of survival to age 65 are 639, 686, and 824, per 1,000, a range of nearly 30 percent.

In considering *annuity* instead of *insurance* costs it is desirable to use a mortality table which really contemplates the most plausible situation in regard to life contingencies over the future. Such a forecast table would indicate more truly the expectancy of survival for the person now 80, for the person now 60, and for the infant. Such a table prepared for persons now aged 20 shows a rate of 713 per 1,000 surviving to 65, an increase of more than 15 percent over that indicated by the 1933 tables. The work of preparing "forecast" tables introduces methods slightly different from those utilized in the preparation of the old "experience" tables. Terminology concerning what we "expect" would be more correct in connection with forecast than with experience tables.

It will not be a single life table which is thus prepared, but rather a series of tables somewhat after the fashion of the select portions of existing life tables which cover the brief period following selection. We are not even sure of the mortality rates at various ages in the past. Extrapolation from them may develop cumulative errors. Our

Chart I.—*Life insurance experience contrasted with population experience and Dublin's Hypothetical Table: Percent of specified age who reach 65* [1]



[1] See tables 1, 2, and 3 for sources of data.

records of vital statistics are known to be somewhat inaccurate and incomplete in spite of efforts to avoid these limitations. There has developed a technique of population extrapolation from past apparent trends with varying understanding of the component forces. Under such methods, presenting low, medium, and high estimates, there is a wide range among the various estimates of the age 65 survivors of 1980. There can be a large cumulative effect of slight variations between estimated and actual forces working over a period of 40 years.

A number of factors which enter into estimates of survival and their influences on costs are discussed in the following paragraphs.

Diminishing Death Rates and Their Ultimate Effect.—Improved medical science may keep alive a large number of physically unfit persons for a time, thereby adding damaged lives at higher ages. It is commonly hoped that the work of sickness prevention or health conservation will add much to the probability of survival by protecting large areas of the population from scourges of one sort and another. It may permit not merely a postponement of death but permanent improvement in vitality sufficient to reduce death rates steadily even at the higher ages, where improvement has not yet been very marked. Through improved

diagnosis the medical profession is steadily gaining in its ability to analyze what may be wrong with the human body and thus to clear the way for proper treatment and perhaps alleviate pandemics. The pneumonias, for example, can now be recognized more readily. A greater knowledge permits correct treatment to be promptly applied. It is conceivable that a large increase in survival may develop from this greater knowledge of the human system.

Accident Prevention.—At the same time that gains have been made in general health conditions, an increasing number of mechanical devices have been developed for common use, such as the automobile and the airplane. These produce added accidental causes of death which must then be analyzed with the goal of reducing accident frequency through a more thorough understanding and mastery of the equipment.

Weight of Death Payments vs. Life Benefits.—The value of the death payments under the old-age insurance program is decidedly smaller than the value of old-age annuity benefits. Reduction in number of death payments would follow improving mortality. This gain, however, would not balance the greater outlay to a larger number of annuitants who would survive because of improved mortality. Improving mortality, which with the life insurance company has heretofore been so much on the side of safety, becomes a debit in relation to Federal old-age insurance cost. When 80 to 85 percent of the benefits are retirement annuities rather than death settlements, improving mortality becomes a cost liability.

Survival After 65

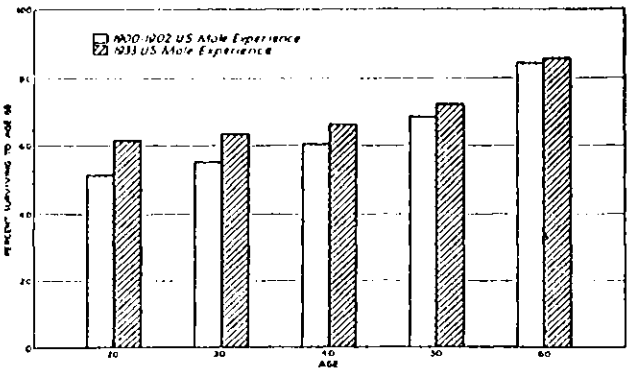
Whelpton and Thompson's [1] studies of future population growth have progressed to the point where from past mortality rates future mortality rates have been reasonably estimated. These show such marked possible reductions in the death rates from ages 65 to 80 as to add perceptibly to the prospective duration of monthly benefits under the Social Security Act. Elderton had assumed in his forecast tables[2] that eventually mortality improvement would become markedly effective at the advanced ages. An increased life expectancy of as much as 20 percent could be deduced from some of the Whelpton-Thompson assumptions above age 65.

Continued Employment After Age 65

Deferred Retirement

Monthly benefits under the Social Security Act differ from the customary deferred annuity of the private insurance company, payable upon the attainment of a given age, in that they are subject to reduction when the beneficiary engages in "regular employment." Thus, a most important part of estimating the costs of future benefits is concerned with the delay in retirement beyond the age of 65. In the early estimates of the Committee on Economic Security it was thought that an average of 2½ years' deferment could be safely assumed. In another estimate the deferment was 1¾ years. In one major industry it has appeared that retirement has been deferred 5 years beyond age 65 in the past. Deferment is

Chart II.—*United States population experience 1900–1902 and 1933: Percent of specified age who reach age 65* [1]



[1] See table 2 for source of data.

obviously not entirely a matter of personal choice. It involves many components determined by individual and general economic considerations.

Employer and Employee Planning.—When a worker plans in advance to retire at age 65 he arranges his personal affairs accordingly, so that work termination will be possible. When the employer plans on 65 as a normal retirement age for his workers he tends to make room for younger men by the retirement of the older. With knowl-

[1] Thompson, Warren S. and Whelpton, P. K. "The Population of the Nation." *Recent Social Trends in the United States; Report of the President's Research Committee on Social Trends.* New York and London, McGraw-Hill Book Company, Inc. 1934. Ch. 1, pp. 1-58. Whelpton, P. K. "An Empirical Method of Calculating Future Population." *Journal of the American Statistical Association.* Vol. 31, No. 195 (September 1936), pp. 457-473.

[2] Elston, J. S. "Sources and Characteristics of the Principal Mortality Tables." *Actuarial Studies No. 1.* New York, The Actuarial Society of America, 1932, pp. 115-116.

edge that the worker will have an assured retirement income, both employer and employee will tend to accept 65 as the retirement age.

Working Capacity and Work Opportunities at Advanced Ages.—Waning physical and mental powers remain one of the dominant reasons for retirement. If the man of 65 in the future is as good a risk as a man of 60 today—a hope held out by those working for improved health conditions—one of the major reasons forcing him out of work at 65 will no longer be dominant.

When it is believed that there are not enough jobs to go around, it sometimes seems desirable to give jobs to the younger and more energetic men and to deny them to the older men. With an increasing proportion of the aged in the population and the accumulation of real skills and experience for a more stable civilization, better work opportunities may develop for older men.

Table 1.—*Insurance experience: Percent of specified age who reach age 65*

Age	American Experience [1]	Medico-Actuarial [2]	American Men [3]		Group Insurance	
			Select	Ultimate	General [4]	Clerical [5]
15	51.2	.....	59.2	59.2	60.1	68.3
20	53.3	.....	60.4	60.3	60.9	68.7
25	55.4	63.3	61.7	61.5	61.7	69.2
30	57.7	64.9	63.1	62.9	62.7	69.8
35	60.3	66.5	64.6	64.3	63.9	70.4
40	63.2	68.3	66.3	66.0	65.5	71.4
45	66.5	70.5	68.8	68.2	67.7	72.9
50	70.7	73.6	72.4	71.5	70.8	75.4
55	76.4	78.4	78.2	76.6	75.8	79.6
60	85.2	86.1	87.9	85.1	84.2	87.1

[1] The American Experience table of mortality was prepared from mortality experience among the policyholders of a mutual life insurance company from 1843 to about 1860. It was first published under its present name in a schedule attached to an act passed by the New York State Legislature in 1868. The figures in this column are based on data in a paper by Fackler, David Parks. "The Genesis of the American Experience Table." *Actuarial Society of America, Transactions*, Vol. 10, No. 39 (May 21 and 22, 1908), pp. 509–514.

[2] The mortality rates from which these figures were computed were developed from a study of the experience of 43 companies conducted by a joint committee appointed by the Association of Life Insurance Medical Directors and the Actuarial Society of America. The data cover approximately 93 percent of the policies issued from 1885 to 1909 by all legal-reserve companies in the United States and Canada. See *Medico-Actuarial Mortality Investigation*. New York, The Association of Life Insurance Medical Directors and the Actuarial Society of America, 1912. Vol. 1, p. 89.

[3] Based on tables prepared by the Actuarial Society of America with the cooperation of the American Institute of Actuaries and the National Convention of Insurance Commissioners, analyzing the experience of some 60 companies. See *American-Canadian Mortality Investigation; Based on the Experience of Life Insurance Companies of the United States and Canada During the Years 1909–1913, Inclusive, on Policies Issued from 1843–1914, Inclusive*. The Actuarial Society of America with the Cooperation of the American Institute of Actuaries, 1919. Vol. 2, p. 182. The "select" figures include, and the "ultimate" figures exclude, the experience during the first 5 years a policy is in effect. The "ultimate" figures are commonly considered as indicating what the experience might have been if no medical examination had been required and no adverse selection on that account had followed.

[4] From Cammack's General Group Mortality tables for nonhazardous industries based on the group insurance experience of 6 large insurance companies for the calendar years 1925 and 1926. The data exclude individuals who were permanently and totally disabled prior to age 65; the figures thus show the percentages attaining age 65 as "active lives." See p. 257, Cammack, E. E. "Mortality Tables Constructed upon the Experience Under Group Policies." *Actuarial Society of America, Transactions*, Vol. 28, No. 78 (October 20 and 21, 1927), pp. 247–262.

[5] Developed in the Office of the Actuary, Social Security Board, from group life insurance data, 1932–35, among clerical workers. Source: Committee on Group Mortality Investigations. *Combined Group Mortality Experience, 1932–35*. Processed. 12 pp.

They will not then feel themselves barred from employment. Men in good health may not be anxious to terminate well-paid employment in exchange for a small old-age income.

Ratio of Old-Age Benefits to the Available Wage.—So long as any real choice exists, the degree to which workers retire voluntarily will be greatly influenced by the size of the benefits. Benefits have been set down as possibly averaging $17 a month in 1942, $44 a month in 1980. It would seem, therefore, that given the same level of living costs, the man eligible to retire in 1980 on $44 a month would be more willing to retire than would the man in 1942 at $17 a month.

Standards of Living.—Among the factors influencing the postponement of retirement there will undoubtedly be the community attitude towards higher living standards and the general conception of what constitutes a proper balance between consumption and production. A high standard of living for the whole community seems to need the productive cooperation of a large proportion of the citizens. This may determine how many of the competent elderly persons will continue at work rather than retire. Into this relationship will enter the ratio of the prospective monthly benefits to current possible earnings.

Return of Annuitants to Covered Employment

As a credit to the cost of old-age benefits, the extent to which persons will engage in "regular employment" after they have once retired has been but little considered. While the vitality of the older man and the older woman is doubtless reduced with advanced age, it is possible that work opportunities for the aged may develop in the future, functioning in almost the same way as deferred retirement. Information on this factor will slowly develop from the records of old-age benefits claimants and the recipients of old-age assistance. It can hardly be regarded at the moment as a very tangible cost reduction, though it may become so.

Migration

Most impressive among many American private and social insurance plans for old age is the virtual intention that once a person is covered he is, if he survives to old age, eligible for a benefit. This is not altogether true in Great Britain's old-age insurance program, where a man may drop out of

coverage after having been a member for a long time and can then anticipate no benefits under the strictly contributory plan at age 65. Should he need the benefit, however, he can at 70 apply for the same amount as a noncontributory pension. Since considerable emphasis has been placed on the nonforfeiture position of covered American workers, it is doubtful whether Congress will ever provide that migration from the United States will terminate right to benefits. On the other hand, migration into the country will add more coverage, and when migration involves short-service periods of work, the resulting benefits will presumably be considerably in excess of those justified by assuming that the current title VIII taxes on the wages of such persons are individual annuity premiums.

The history of migration has shown marked vagaries from decade to decade. Now that most countries are somewhat impressed with the prospect of decreasing rather than increasing populations, the only countries from which we could logically expect many immigrants because of growing populations would be Russia, Italy, Germany, and possibly some of those in the Far East. Migration is extremely important in that it is apt to be changed by political factors, for quotas may be shifted when it is deemed expedient to modify them.

Of probably greater importance is the migration from noncovered to covered industries.

Industrial Development and Technological Improvement

The development of industry has been of incidental importance in its effect upon coverage, both before and after 65. This factor is of importance as a separate influence in the balance between covered and noncovered employment and in the development of work opportunities for an enlarged community where increased mechanization may be facing agriculture, construction, and other surviving craft forms of enterprise. The influence of industrial and technological development is thrown into high light in social insurance, since social insurance attempts to deal reasonably with those who have lost jobs. It could temporarily eliminate large groups of workers. Many engineers believe that great advances in per capita productivity are possible. The influence of such progress could either be directed toward increased goods or decreased work. Probably an unpredictable combination of the two alternatives is ahead.

Operating Expenses

The wage records maintained for the old-age insurance program are very voluminous and yet very simple. What expenses will be assumed in addition to this minimum cost of recordkeeping depends upon the basic philosophy of social insurance. The work is largely done by the Federal Government, and such factors of overhead as are represented by rent, postage, building service, retirement benefits and compensation benefits for Government employees, for example, may be shared with all other Government departments and be financed in a different way from that which is customary in insurance-company statements. Practically, however, just as the insurance company builds, so a Government erects a building to house its new activities. Most of the expenses of the insurance company have their counterpart in the Government. The operating expense rate for old-age insurance should be reasonably low because of the relative simplicity of the record forms and the economies of quantity production. Part of the saving which results from the fact that compulsory coverage eliminates sales work must, in social insurance, be expended for educational or informational activities. The crude cost estimates of the Committee on Economic Security assumed that ultimate administrative expenses would represent 5 percent of the title VIII tax collections in 1949 and thereafter. This still seems reasonable enough. Because of lag, early recorded expense rates may be unduly low as evidence of permanent costs. Other expenses will be dependent upon the extent to which the records compiled for the purpose of old-age insurance claims administration are made available to the whole broad field of social insurance, including unemployment compensation and health insurance, for example, and how wisely the social value of additional use of data derived from records kept in any case can be assessed, when extension to other surveys may add considerably to minimum costs. This leads into the field of conservation and general planned activity. Such extension of program must be handled slowly and with discretion. Costs may *seem* extreme and *be* economy. The cost-accounting activity in a multiple-line company suggests how to estimate what they are.

LESS TANGIBLE INFLUENCES

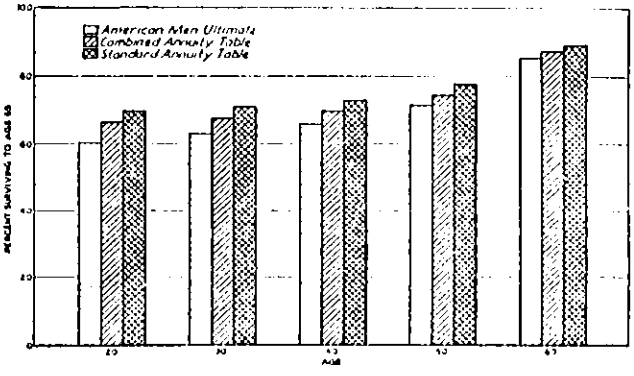
Political and economic influences upon industrial development can conceivably force dramatic change in the progress of benefit scales under old-age benefits. If social insurance develops to a point where it takes, for example, from 15 to 20 percent of the total income of the Nation, various economic factors might more than compensate for the cost. One development might be an increase of from 15 to 20 percent in working output so as to increase present living standards for all the working group and at the same time allow them to add to their activity for the sake of better standards for the nonworking group also. Already the workers are supporting all the nonworkers. The orderliness of budgeting for our social responsibilities and cooperation in maintaining those who by force of circumstances are unable to fend for themselves should improve and not reduce living standards, if possible.

Looking back over the last 45 years we can see intensive changes in the relationship of industry and commerce to agriculture and to service activities of the community. Similar changes might involve marked increase in the extent of paid employment of women who, through labor-saving devices, have been freed from much of the drudgery in the home. They could, therefore, contribute out of their saved time toward the enlargement of the entire community's services.

If, in the process of evolution, certain industries or industrial units were taken over by the Government, changes in coverage might result. Government employees are at present excluded from coverage under the old-age benefits provisions of the Social Security Act.

The current program under titles II and VIII of the Social Security Act can be considered as very largely a savings or banking program, where the emphasis is largely upon return of investment plus some interest. To some students of the subject social insurance seems more adequately handled through a greater use of the straight *insurance* idea of risk, with the chief emphasis upon protection, cooperation, and the elimination of any careful balance between the individual rate of contribution and the individual benefit, so important a tradition in private life insurance company activities. The banking philosophy may postpone unduly long the effectiveness of the social insurance plan. Changes will doubtless be made in the structure of the old-age insurance plan following shifts in social philosophy.

Chart III.—*Annuity experience contrasted with life insurance experience: Percent of specified age who reach age 65* [1]



[1] See tables 1 and 3 for sources of data.

Social insurance, like most other Government activities, is paid for through the use of the taxing machinery. The financial arrangements are tax arrangements. With the passage of time, tax consciousness shifts, thereby changing in turn tax arrangements. The present division of tax burden between the employee, the employer, and the general taxpayer seems largely one of expediency and has been determined by the level of economic understanding at the time the program was adopted. As this specific tax responsibility becomes integrated with other tax responsibilities, such integration will effect changes in the number of persons who accept benefits and in the very formula of benefits. The chance of a full public understanding of taxation seems remote. The effect of such understanding on program and costs is vital.

The very small early benefits payable under the old-age insurance program of the Social Security Act may be supplemented by payments to needy beneficiaries under the old-age assistance provisions of the act. A needy aged person of either sex now looks to old-age assistance and State laws for aid when the immediate family seems unable to furnish support. Old-age assistance in its general provisions assumes a family cohesiveness for old-age support not specifically recognized in setting down the benefits under old-age insurance. Since old-age assistance functions through Federal subsidies to various State programs, the attitude of the various States will control the exact degree of responsibility demanded of the family. Insofar as an individual receives

benefits under both the assistance and insurance programs, the divergent emphasis upon family responsibility in old-age assistance will carry over into old-age insurance. The trend in old-age assistance administration seems to be away from reliance upon other members of the family for support. In the development of social insurance it is recognized that without cooperative budgeting public assistance may be extremely awkward. Social insurance is probably society's attempt to create some acceptable framework through which its various members may jointly contribute to the provision of specific benefits when a member loses his income from a job. The family organization is a small unit in the bigger organization of all citizens.

Table 2.—*United States population tables for white males: Percent of specified age who reach age 65* [1]

Age	1900-02	1909-11	1919-21	1920-29	1929-31	1933 [2]
15	59.3	59.7	58.5	58.8	58.8	60.7
20	51.4	51.6	50.6	50.6	50.6	61.4
25	53.1	53.0	61.0	60.8	60.6	62.2
30	55.1	54.6	62.6	62.1	61.8	63.3
35	57.5	56.7	64.6	63.6	63.2	64.5
40	60.4	59.4	66.9	65.6	65.0	66.2
45	63.9	62.8	69.7	68.3	67.6	68.6
50	68.5	67.3	73.3	71.9	71.3	72.1
55	74.8	73.5	78.5	77.3	76.8	77.4
60	84.5	83.4	86.6	85.7	85.5	85.7

[1] From census data for years specified reported in: U. S. Department of Commerce, Bureau of the Census. *Mortality Statistics.* Washington, D. C. U. S. Government Printing Office.
[2] "Life Table for White Males in the Continental United States, 1933." Computed by Statistical Bureau, Metropolitan Life Insurance Company.

In determining the virtually fixed interest rate of 3 percent per annum under the old-age reserve account, the problem of estimating future interest rates seems to have been solved. There remains the problem of the probability of change in such a base rate by amendment. If it is decided that the interest rate on the old-age reserve account should be determined more in accordance with the principles which have at the moment established 2½ percent as the rate in the one Federal flexible interest-rate plan, reduction in future returns from interest are to be considered possible. If, on the other hand, the rate on Federal bonds comes to be regarded as purely arbitrary, an increase to a higher rate, further veiling the extent of what some regard as a Federal subsidy, might be logical.

LIMITATIONS OF ESTIMATES

Under a social insurance plan, cost estimates of future payments to the aged and of concomitant payments to surviving relatives of deceased workers or to their estates involve all the elements discussed above. Studies must be carried forward, using pertinent data so that periodically the cost effects of mortality, health, migration, wages, retirements, work opportunities, and interest returns may be more closely approximated. The limitations upon applying the results of the studies directly to probable future costs must be clearly understood. Modifications in program may be economic; they are also political. Wise changes may be expected to follow the gradually growing comprehension of social insurance.

Provisions for old-age security are also closely interrelated with the entire field of social budgeting. It is possible that the present death payments under title II, which have been treated very lightly in these cost discussions since they are actually a minor portion of the program, may develop into survivorship benefits somewhat similar to the British program for widows and orphans. With every proposed extension in program, a full understanding of cost elements and the limitations on their evaluation becomes more essential. Family relationships and the distribution of primary and secondary beneficiaries by age, sex, race, and extent of paid employment, will become more important.

Life insurance, while anticipating a general improvement in mortality, nevertheless plans on an additional contingency margin in estimating future costs. To a greater extent must social insurance do the same thing, where most of the trends seem to be toward cost increases. Contingencies bulk much larger in the social insurance field. One of two important alternative decisions is desirable: (1) whether to provide for a much larger contingency margin in determining prospective tax rates when it is initially presumed that they can be determined for all time; or (2) whether to admit that there will probably be future increases in the tax rates in excess of those already stated in the act, recognizing that it is impossible to determine tax schedules for all time.

The separation of the tax and benefit titles in the Social Security Act has left doubt as to their exact relationship. In this peculiar American problem considerable circumlocution seemed necessary in outlining how old-age benefits costs are presumably to be met. Since the benefits under title II are based upon the same wages which are being taxed under title VIII, it is frequently implied that the tax collections beginning at approximately 2 percent of such wages in 1937, rising to 3 percent

in 1940, 4 percent in 1943, 5 percent in 1946, and 6 percent in 1949, are specific contributions by and in behalf of the employees toward their ultimate benefits. Strictly, however, these taxes are not earmarked. They become part of the general revenues and are pooled with all other Federal taxes. The appropriation authorized by title II year after year is to be determined in accordance with "accepted actuarial principles." Implicit in most discussion, however, is the assumption that, if tax rates under title VIII when reinforced by interest earnings are sufficient for the obligations incurred under title II, the appropriations to the reserve will in the long run be equivalent to the tax collections less estimated costs of administration.

The cost estimates included in the report of the Senate Finance Committee, indicating a reserve of some $47 billion accumulated by 1980 out of the excess of appropriations over benefit payments, involved approximate values assigned to the six relatively measurable factors discussed above. The remaining five less tangible factors have not entered materially into these estimates, since the probability of change in program was not regarded as subject to valuation. Before the question of yearly appropriations and the growth of the reserve can be discussed adequately these "imponderables" must also be taken into account.

Following the publication of the reports of the Senate Finance Committee and of the House Committee on Ways and Means, with their tables showing the progress of reserves, two somewhat different explanations of the factors entering into these estimates were made. One explanation assumed an average full-time wage of some $1,100 per annum, the other an average per capita taxable income of less than $1,000. Certain special ages of entry for new members into the covered group, once the initial coverage had been completed, were assumed by the latter explanation. Two slightly different estimates were made of the effect of delayed retirement beyond the minimum retirement age of 65. One explanation assumed the probability that, as better knowledge of the program developed, provision for costs could be gradually adjusted without assuming just how taxes would be collected over all time. The other seemed to assume that if a schedule of tax payments now determined for perpetual use were regarded as inadequate to meet benefit payments in the far distant future, provision for additional

Table 3.—*Annuity experience and forecast tables: Percent of specified age who reach age 65*

Age	Annuity experience (male)				Forecast tables		
	McClintock's Annuity Table [1]	American Annuitants' Ultimate [2]	Combined Annuity [3]	Standard Annuity [4] 1937	Dublin's Hypothetical Table [5]	Whelpton's future estimates [6]	
						Present	Ultimate
15	49.6	.....	65.5	69.4	76.4	70.4	75.3
20	51.5	.....	66.2	69.8	76.9	71.3	75.8
25	53.6	59.0	66.9	70.3	77.6	72.5	76.5
30	55.9	61.3	67.6	70.9	78.6	73.6	77.2
35	58.5	63.0	68.5	71.8	79.7	74.9	78.0
40	61.4	65.1	69.8	73.0	81.0	76.4	79.1
45	65.0	67.9	71.7	74.9	82.4	78.5	80.6
50	69.6	71.7	74.7	77.8	84.5	81.3	82.9
55	75.8	77.4	79.5	82.1	87.3	85.1	86.2
60	85.2	86.0	87.1	89.0	92.0	90.9	91.4

[1] McClintock's Annuity table was the minimum standard basis for the valuation of annuities in New York State from 1907 to 1930. It is based on graduated and adjusted experience of 16 American insurance companies prior to 1892. See McClintock, Emory. "Special Tables for the Estimation of Mortality Among Annuitants." *Actuarial Society of America, Papers and Transactions*, Vol. 6, No. 21 (May 18 and 19, 1899), pp. 13-23.

[2] Based on an investigation by Dr. Arthur Hunter covering approximately 95 percent of all immediate annuities, issued in the United States by 20 companies, prior to and including 1917. The figures exclude experience during the first 5 years the policies were in effect, in order to eliminate the influence of selection in the early years. See Hunter, Arthur, "Mortality Among Annuitants and Premiums Based Thereon." *Actuarial Society of America, Transactions*, Vol. 21, No. 63 (May 20 and 21, 1920), pp. 157-177.

[3] The Combined Annuity Mortality table was prepared a few years after insurance companies began issuing group annuities. Meager annuity experience was available for the younger ages, hence an empirical table was constructed with Cammack's Group Life Clerical Mortality table as a foundation up to age 60, combined with the American Annuitants' Ultimate table at the higher ages. The Combined Annuity Table has been the minimum valuation basis for all annuity contracts in New York State since 1930. See Craig, J. D. Discussion of E. E. Cammack's "Mortality Tables Constructed Upon the Experience Under Group Policies." *Actuarial Society of America, Transactions*, Vol. 29, No. 70 (May 17 and 18, 1928), pp. 118-125.

[4] This table was prepared in a manner similar to that of the Combined Annuity table (see footnote 3). With certain adjustments, 1932-1936 group life clerical mortality experience was used for the younger ages and then graded in at age 60 to the American Annuitants Select table adjusted for improvement in mortality among annuitants since 1918. See Kincke, Frank D. "A New Annuity Mortality Table." *Actuarial Society of America, Transactions*, Vol. 39, No. 99 (May 19 and 20, 1938), pp. 60-65.

[5] A hypothetical table based on a New Zealand life table (1931) adjusted for U. S. population experience in 1920-31. See Dublin, L. I. and Lotka, A. J. *Length of Life*. New York, Ronald Press Co., 1936, p. 194.

[6] Whelpton's estimates indicate probable changes in the composition of the future population of the United States, resulting from prospective trends in birth and death rates and in net migration. The "present" rates refer to persons aged 20-24 in 1930; the "ultimate" rates involve estimated mortality rates at ages attained in 1980. Figures computed in the Office of the Actuary, Social Security Board, from data in Whelpton, P. K. "An Empirical Method of Calculating Future Population." *Journal of the American Statistical Society*, Vol. 31, No. 195 (September 1936), pp. 457-473.

appropriations beyond the yield from such special tax schedules would be immediately necessary. The validity of assuming that one *can expect* to strike a balance in perpetuity may be questioned. Adjusting the end factors to obtain balance might be too simple.

In analyzing the cost estimates for the later years, as set forth in the Senate Finance Committee report, it seems probable that the following situations need to be tentatively recognized now. (1) Many more workers will probably be covered than the Senate report data seemed to indicate, though its cost analysis was in terms of dollars of benefits rather than number of recipients. (2) Many of the workers covered are apt to have limited periods of covered employment, and their benefits will be larger in proportion to their taxes than will the benefits for long-term members of the plan. (3) Many more annuitants from the covered group will survive to age 65 and will live longer after reaching age 65 than indicated as probable in the use of the life tables prepared from census data for the Committee on Economic Security. It seems likely that recent mortality improvement may be expected to continue into the future.

A careful revaluation of these three factors, ignoring the possibility of changes in wage levels, might easily show a 50-percent increase in benefit payments in 1980 over the figure of $3.5 billion set forth in the Senate Finance Committee's report. The 1980 benefit payments and expenses of administration were there assumed to approximate 10 percent of the annual compensation of the covered employees of that year. If a 50-percent increase occurred in benefits without a change in pay rolls, the costs might reach 15 percent of pay rolls. With a small increase in aggregate taxable pay roll of the period, the percentage of cost might lie somewhere between 10 and 15 percent.

Over against the six simpler elements of costs, the five "imponderables" are much more important and, of course, virtually unmeasurable. Changes in basic philosophy seem fully as probable as formula changes, but their specific trends are much less predictable.

The problem of social insurance costs, were it not for the need to determine how the costs are to be met and the assumption that we can predict them accurately, would not be a pressing one. The right to make subsequent modifications in benefits and taxes is explicit in the act, and the meaning of that right can be fully understood. Logical changes in estimates of future costs can be made much more easily after the completion and full review of comprehensive studies herein indicated as necessary. The recognition of this dominant safety factor with freedom from pretense that any all-time maximum rate of contribution can be determined today leads away from surprise and dismay and toward mature acceptance of the complexity of the problem.

Studies have been begun which within the next few years should considerably advance the knowledge of many of the factors entering into estimates of social insurance costs. As time goes on, many of these factors will doubtless develop surprising relationships, for we can hardly anticipate the next steps in the rapid changes within our economic situation. We are quite uncertain as to the relative importance of the factors and their component parts. We need not be surprised, either, by the discovery of additional factors not herein discussed, factors which may outweigh all others in importance. Costs may be what we make them, but we are not yet sure how control can be exercised.

This major indefiniteness, therefore, must be accepted as inherent in any social insurance plan. No one should pretend that the precedents of the relatively simple problems of the insurance business or of the single employer pension fund permit the determination of any accurate costs today for our program of old-age benefits. We should be especially wary in believing that the mere assumption of values for the factors before data can be assembled gives any adequate support to the plan. The accumulation and analysis of such data will take years.

This indeterminate quality of old-age insurance costs may itself be the strongest argument for shifting our attention from the problems of 1980 to a more thoroughgoing consideration of present needs. We cannot foretell the future, but we can see the necessities of the present. A shift in attention should be most rewarding.