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ECONOMISTS, ACTUARIES, AND SOCIAL INSURANCE

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MR. ROBERT J. MYERS: Discussion Note--

THE ROLE OF ACTUARIES AND ECONOMISTS IN COST ANALYSES AND FINANCING ASPECTS OF SOCIAL SECURITY PROGRAMS

Social Security programs have played an increasing role in the national economy in the United States in the past four decades, and many persons are advocating a still more expanded role. By the term "Social Security" is meant not only the Old-Age, Survivors, and Disability Insurance system (OASDI) and the Medicare program, both established by the Social Security Act, but also such other programs as unemployment insurance, Workmen's Compensation, temporary disability insurance programs, and even public assistance programs such as Aid to Families with Dependent Children, Supplemental Security Income, and food stamps.

With the great importance of Social Security programs, it is only natural that there should be intense interest on the part of not only legislators and policy planners, but also the general public with regard to both the costs involved and the related financing aspects. The question then is, to whom should the public look for guidance in this area? What profession should have the fundamental responsibility for analyses of the costs and for the financing methods of Social Security programs? In a field as broad as this, no single group or profession has all the answers or all the capabilities for analysis.

The choice would seem to lie between actuaries and economists, although possibly some might believe that accountants or statisticians are qualified. At times, the responsibility may be assigned to economists solely because the actuarial profession is much less well known or because only a few

actuaries are employed by the federal government or by universities (which are often looked upon as being impartial since they are not "tainted by the profit motive" -- as are most employers of actuaries).

Definitions of Actuary and Economist

Before discussing the relative roles of actuaries and economists in cost analyses of Social Security programs, it is perhaps best to describe what these two professions are and what qualifications and abilities must be possessed. Hopefully, the writer, as an actuary, will have an open mind on the subject and will present the arguments objectively, so as to "substitute facts for appearances and demonstrations for impressions." Quite naturally, this calls for being neither overly proud of actuarial abilities, nor overly modest.

There are many good definitions of "actuary", but in my view, perhaps the best is that given by John M. Bragg (Transactions, Society of Actuaries, Vol. XXVI, page 408), which is as follows:

> A professional, skilled in mathematics, who is expert at the design, financing, and operation of insurance plans of all kinds, and of annuity and welfare plans.

But going beyond this is the fact that the vast majority of actuaries in the United States have qualified for the profession by passing a long series of rigorous examinations on a wide variety of subjects, ranging from mathematics, statistics, demography, and accounting to the operational procedures of various types of insurance plans (including Social Security). Moreover, a large number of actuaries have had university training in economics and related subjects sufficient so that they could have obtained at least a bachelor's degree with an economics major. In addition, actuaries have strict Guides to Professional Conduct. Among other things, these restrict actuaries from giving advice on subjects which they are not qualified to assess.

The definition of "economist" is extremely broad and vague -- in part because of the vast number of areas that can be involved. Membership in the American Economic Association, for example, depends only on being "interested in economic inquiry", providing a letter of nomination from a member, and paying the necessary dues. No code of ethics is involved, and the economist can readily enter any field he chooses and become an "instant expert" without fear of being termed unprofessional. Thus, to a considerable extent, a person can call himself an economist even without any professional background therefor . It is true that a person can equally call himself an actuary without being a member of a recognized professional society and passing a rigorous series of examinations, but few actuarial employers will accept such an individual's professional status.

Cost analyses of Social Security (or any other economic area) quite necessarily require a considerable amount of mathematical ability. Although some economists are truly mathematically trained and able, a large proportion of them do not have these qualifications and have not had to prove their proficiency in this respect by passing rigorous examinations. Then

too, economists who are mathematically able are often highly skilled in advanced theoretical mathematics, but do not have the essential experience that comes from the recurring solution of practical problems, as do actuaries. Few economists have had even a single academic course or other formal study in actuarial science. Yet, there seems to be nothing that inhibits economists from making cost estimates (and even labeling them as "actuarial cost estimates".)1/

Some would argue that a person is an economist really only if possessing a Ph.D. in that field. With all due deference to academia, the author is constrained to say that not all successful Ph.D. candidates are outstanding professionals or experts. The significance of a Ph.D. degree depends to a considerable extent on the calibre of the institution granting it, and even then some Ph.D.'s are awarded more on persistency than on ability or achievement. As C.L. Trowbridge so well brought out in his 1975 Presidential Address to the Society of Actuaries: "the federal government worships the Ph.D. degree and tends to call upon academia for its research needs."2/

Some Erroneous or Anomalous Positions Taken by Economists on Social Security Matters

In general, economists in their consideration of Social Security programs, expecially ones involving long-range benefits such as OASDI, tend to lack knowledge of the fundamental nature of insurance and pension plans. As a result, some economists argue that social insurance systems are not "insurance" 3/, and then from this erroneous conclusion they develop dubious proposals and recommendations.

At times, economists believe that insurance must involve the money-back (or savings bank) principle. They appear to be unaware of such facts as the nature of term insurance or of single-premium annuities with no death benefit (or even the rare, but actuarially-valid annual-premium deferred annuity with no death benefit).

Other economists, however, do recognize that insurance need not have the money-back feature, but they still conceive of it solely in terms of the individual-equity principle, combined with full actuarial reserves. Once again, there is not the awareness of such vital facts as modified reserve systems for individual policies (such as the full preliminary term plan) and, even more important, the absence of current full funding of past service liabilities in the vast majority of private pension plans.

The problem of the incidence of taxes of various types attracts great attention. Most commonly, economists conclude that the employer tax in a contributory social insurance system such as OASDI is, in reality, paid by the employee. A simplistic explanation often given is that, in the absence of the social insurance program, the employer would have paid larger wages. Going beyond this, some economists reach this conclusion on the basis of complex regression models (which, however, require many arbitrary assumptions).

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But who really knows whether this is so? The employer himself may bear part or all of the cost of the employer contribution out of his own pocket (as many employees undoubtedly believe). Or, as seems more likely, part or all of the cost of the employer contribution is passed along to consumers (who largely consist of the workers covered under the social insurance system if it is nationwide and has comprehensive coverage, as does OASDI) as a cost of production, in the form of higher prices.

In fact, it can even be argued that the employee contribution rate is really paid by the employer, since workers are concerned only about their take-home pay and may strive to maintain or improve it, regardless of "deducts", through collective bargaining or otherwise. A classic example of this occurred in the Netherlands shortly after World War II when an old-age pension plan was established, to be financed (as it appeared in the law) solely by employee contributions. At the same time that the constributions began, a wage increase was legislated to go into effect, at a rate slightly higher than the contribution rate. As a result, the workers had slightly larger net take-home pay and were apparently "paying" completely for a social insurance system. But who was really paying the cost for such a program?

It is great intellectual exercise for economists to attempt to analyze the incidence of taxation, expecially in the social insurance field. However, the author is convinced that this is really an impossible task, especially after the initial impact of a tax has been dissipated and spread throughout the economy. When such analyses are dissected, it is found that, since so many assumptions of an arbitrary nature necessarily had to be made and so many factors had to be ignored, the results are of only academic interest and have no practical importance.

Another general difficulty that economists have when they direct their attention to Social Security programs is their failure to recognize that, in the vast majority of private pension plans, the employer does not contribute the same proportionate amount (relative to salary) for all employees. Rather, much more is paid for older workers than for younger ones. Thus, even if one concedes (or, better, assumes) that the employees in the aggregate pay the employer contribution under a Social Security system, this is no reason to hypothesize that each employee should be assigned the employer tax based on his wages; certainly, there is no parallel analogy to this in the private pension area.

Even though economists frequently argue that their analyses are quite precise -- and that therefore their conclusions and recommendations are valid and should be adopted -- this is by no means the case, as it is often so in the physical sciences (including mathematics). This situation has been well put by Carl F. Ritz when he stated in The Actuary for November 1975:

> If the margin of error in the physical sciences were as large as in the social sciences, we would probably be a century away from putting a man on the moon, and two centuries away from getting him back.

J. Douglas Brown, former Provost and Dean of the Faculty of Princeton University and a member of all but the most recent Advisory Council on Social Security, has well pointed out the inherent weakness in the methodology of many economists when they study and make recommendations on Social

Security programs when he stated:4/

> Economists who attempt to dissect out the elements of a contributory social insurance program in terms of taxes and the redistribution of funds often lose sight of this vital principle of mutual contract which runs through the program as a whole. Like any living organism, a social insurance system is more than the sum of its parts. For the economic analyst, the mystique of common habits of mind appears tenuous indeed, yet it is this mystique which has assured the survival and growth of a valuable social mechanism.

Dean Brown then went on to point out the advantages and attractions of the contributory feature of social insurance systems -- the implied "social contract" between the generations of contributors and the nation as a whole, the responsibility of the covered population in their desires for expanded benefits if they pay part of the cost directly and visibly, and the resultant cost controls and balances. He summarized as follows:

> The foregoing summary of the evolution of the feature of worker contributions in social insurance is the preamble for a much-needed refutation of the arguments of well-intentioned liberals and economic analysts who would alter the concept of a uniform employee contribution in social insurance out of the context of its long-tested acceptance. To them, an employee contribution is a tax like other taxes. Since it is a uniform tax on all earnings below a fixed ceiling, it is, as a "tax", regressive in its total effect. (In dissecting the system into its parts, the fact that benefits are graduated in favor of the lower-income participant is set aside). Since it is assumed that all regressive taxes are bad, the uniform tax under social insurance is bad and should be changed.

Now let us turn to several recent examples where economists have taken erroneous or anomalous positions in the field of Social Security. These will be dealt with purely in alphabetical order.

(a) The Brittain Analysis of Social Security Financing

John A. Brittain, an economist with the Brookings Institution, made an extensive analysis of the financing of the OASDI program and came forth with some rather sweeping proposals for changes. 5/ He lays the foundation for his views on the thesis that OASDI is not really insurance and that it has been misleadingly analogized to private insurance by all supporters of its current structure. I quite willingly agree that there have been instances of overemphasizing the similarities of OASDI and private insurance, especially by over-zealous officials and their public information staffs. However, this does not negate that, as indicated earlier, OASDI is truly founded on broad insurance principles.

Brittain seemingly does not understand the meaning of "insurance principle", although he uses it often, and does not define it specifically but rather

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only by a general description of its characteristics. He believes it requires, as a necessary condition, the element of individual equity. Apparently, he is unfamiliar with such insurance programs as private pension plans and the various other group insurances, which would not qualify as insurance under his definition. For example, in discussing OASDI, he states that "the taxes and later benefits assigned to a person are not at all closely related, as they are under private insurance" (page 153) and that granting past service credits is "clearly in violation of the insurance principle" (page 139). This must be surprising news to pension actuaries!

As one reason why OASDI is not really insurance, he states that "the risks or expected costs cannot be 'actuarially evaluated' in the usual sense because (1) the expected loss is not related to age, health, and other individual characteristics, and (2) even in the aggregate, demographic projections are not the sole basis for forecasting the cost of the program; this depends heavily also on future benefit legislation, which cannot be forecast by scientific means" (page 8). Having spent many years actuarially evaluating OASDI, I strongly disagree with this assertion, which is also applicable, to a considerable extent, to most private pension plans as well. Certainly, it seems irrelevant to the subject of actuarial evaluation that the program may be changed in the future by legislation.

Having "demolished" the present financing principle of OASDI (namely, solely through payroll taxes) on the grounds that the program is not really insurance, Brittain goes on to argue that the employer payroll tax is entirely paid by the employee on an individual-by-individual basis. As discussed previously, there is really no way that this incidence of the employer tax can be established. Even if this were so in the aggregate for all employees combined, it does not follow that such tax is allocable on a strict pro-rata basis according to covered earnings to each individual employee. Rather, the employer payroll taxes could better be considered to be allocated to the employee individually according to the value of the protection being provided currently in excess of what he himself pays. The same situation is present in most private pension plans.

One of Brittain's recommendations is that there should be an exemption from payroll tax for low-earnings persons, so as to eliminate or lessen both poverty and regressive taxation. As to poverty, one might ask why this action should be taken for only one element of personal expenditure; if it is desired to raise the incomes of those at the lower end of the economic scale, why not do this directly and forthrightly outside the system? 6/ As to regressivity of the payroll tax, Brittain ignores -- or, rather, dismisses -- the fact that OASDI benefit amounts are heavily weighted in favor of the lower paid. 7/

Brittain then goes on to present elaborately derived comparisons of OASDI combined employer-employee taxes and benefits and, in a parallel fashion, the rate of interest which must be realized on the accumulated taxes to "purchase" the benefits for various cases as to age, family composition, and earnings level. All of the usual known relationships occur, but one can question the absolute levels of the results because so much oversimplification was present. For example, the disability and survivor monthly benefits are ignored (and instead in the calculations there is actually a

death benefit of return of taxes plus interest), all are assumed to retire at age 65, and only new entrants in the mid-1960's are considered. Despite elaborate EDP procedures being utilized, Brittain fails to make the simple adjustment of considering taxes and benefits to be payable on a monthly or a continuous basis, but rather he uses an annual basis.

It is not too difficult to find a number of factual errors in Brittain's report. For example, the correct basis for the tax for the self-employed is not given (page 59), and incorrect figures for the Part B (Supplemental Medical Insurance) premium rate are presented (page 139). Some might retort that "consistency is the hobgoblin of little minds" or that "only the broad principles and conclusions are of importance". However, I believe that valid results can be derived only if the underlying details and components are sound and well understood. Also, with evidences of factual errors being present, can the reader be certain that the detailed calculations, for which only the results are presented, are correct, both as to methodology and computation?

Brittain comes to the major conclusion that the long-term objective should be to finance OASDI, not by payroll taxes, but rather solely by income taxes. Here, he completely ignores one very simple factor -- how can the earnings-related structure of OASDI benefits then be retained, both from the standpoint of broad general policy principles and from the very practical aspect of how are the earnings records to be used for benefit computation purposes to be obtained?

(b) The Feldstein Argument for Large Reserves for OASDI

Martin Feldstein, an economist at Harvard University, has advanced the proposition that OASDI should be financed by increasing the tax rates greatly for a few years and thus developing a fund which is sufficiently large so that its interest returns will be so sizable that the payroll tax can thereafter be completely eliminated. 8/ Specifically, he proposes that the combined employer-employee OASDI tax rate (scheduled in present law to be 9.9% through the year 2010 and 11.9% thereafter) should be at once increased to 20-25%. The result, he states, will be an accumulated trust fund of about $600 billion in about 6 years, after which the trust fund, by earning 13.4% interest per year, can pay all OASDI benefit outgo into perpetuity, and the payroll tax can therefore be eliminated completely.

This proposal certainly completes the circle -- and then some! Back in 1935, when the Social Security Act was enacted, a relatively large reserve (ultimately amounting to $47 billion 9/) was planned. In fact, some people have thought that such a fund implied full-actuarial-reserve financing, which was not the case. 10/ And now the "large reserve" argument is back with us again. However, Feldstein wishes to have a large fund, not so much for OASDI purposes as for purposes of capital formation.

Let us look for a moment at the practicality of the Feldstein proposal. There are several aspects of it. First, what about the assumed investment return of 13.4% per annum? This is, of course, far higher than the yields currently on government obligations -- and even on corporate bonds. The basis of such a high yield to be paid to OASDI from the Treasury is that

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this rate is the actual long-range historical return of industry before taxes. Such a high interest rate if paid to the OASDI trust funds would seem to involve some element of a hidden government subsidy to the system.

Second, even assuming the appropriateness of the 13.4% interest rate, would a fund of $600 billion available from the early 1980's on be sufficient to finance OASDI completely without any future income from payroll taxes? The interest income would then be $80 billion annually. However, the OASDI outgo for benefits and administrative expenses is estimated at more than this from 1977 on 11/ and, according to my estimate, would be about $125 billion by the time that Feldstein's $600 billion fund would be accumulated. Moreover, the annual outgo would continue to rise as the system matures and especially as benefits rise due to the automatic-adjustment provisions that change benefit levels as prices rise. How then could the $80 billion of annual interest income from Feldstein's so-called "endowment fund"method of financing do the job?

Third, let us consider what would happen if the combined employer-employee OASDI tax rate were suddenly boosted from the present 9.9% to the 25% probably necessary under the Feldstein proposal to accumulate the $600 billion fund in 5-6 years at 13.4% interest. If this jump occurred, would the rest of the economy stand still? That seems most unlikely! Certainly, workers would demand immediate raises in pay of 7-1/2% or so; they would hardly be content and satisfied with the politicians' promise that OASDI would be "free" after a few years and then its payroll taxes eliminated. At the same time, business concerns would increase the prices of their products and services, both to compensate for the pay raises generated and for the higher employer OASDI taxes. Inflation would then really soar!

Fourth, where would the huge amount of accumulating funds be invested? The answer is that they would be invested in government securities. Then, with these mostly being purchased from private holders, the available funds would go to increase the capital funds of the nation. But who can say what would occur in this investment area if the economically disrupting changes described in the previous paragraph took place (as they would almost certainly do under the circumstances).

Feldstein also asserts that the effect of OASDI payroll taxes in the past has been to reduce the nation's savings by about 35%. Therefore, he concludes that, if it had not been for these taxes, the long-run capital stock of the nation would have been about 55% higher and both the gross national product and wage rates would be about 14% higher. These figures are developed by some very elegant mathematical processes, but they -- and the conclusions drawn from them -- lack credibility because Feldstein has operated under the naive and simplistic approach that nothing else in the economy would have been different in the absence of the OASDI system and its payroll taxes.

If we had not had the payroll taxes at all, because we did not have an OASDI system, there would almost certainly have been almost equally as large expenditures for a public assistance program that would have filled the social needs actually met by OASDI. Taxes (which some would have labeled as "economically undesirable", because they did not build up the nation's capital stock) would have been required to finance such expenditures, and

these taxes would not have been much less than the OASDI ones actually were. So, we are back at about the same point under either set of circumstances, and the capital stock of the nation would not have been greatly affected either way.

(c) HEW Cost Estimates for Workfare Program Proposal

In 1972, when the Senate Committee on Finance was considering legislation embodying the Family Assistance Plan, 12/ Chairman Russell B. Long proposed for consideration instead the so-called Workfare plan. One part of this plan involved a low-wage supplement, which applied to family heads in jobs not covered by the Federal minimum wage law who earned at least 75% of the statutory minimum wage (then $2.00 per hour). The benefit to be paid as a low-wage supplement was 75% of the excess of the minimum wage over the actual wage times the hours worked in the week. Since the actual wage could not be less than $1.50 (75% of $2.00), the maximum hourly benefit rate could not exceed $.375 (75% of the excess of $2.00 over $1.50).

The Department of Health, Education, and Welfare (HEW), which strongly opposed the Workfare proposal, presented cost estimates to the Senate Finance Committee on all aspects of the proposal These estimates were made by economists in the Office of the Secretary, HEW, and not by the actuarial staff of the Social Security Administration (SSA), a component of HEW. The basic procedure in such estimates was to utilize data from a small sample of families derived by an interview process and to apply various sophisticated simulation and EDP procedures thereto.

In connection with the low-wage supplement portion of the proposal, the HEW cost estimate, when analyzed, was found to be based on an average hourly benefit rate of $.68 -- an obvious impossibility, since the maximum possible benefit rate in any individual case was only $.375! 13/ This is a sterling example of the dangers and weaknesses involved when economists make cost estimates for Social Security programs and become so intrigued with "scientific" methods that they lose sight of reality. In other words, they fail to utilize the fundamental approach commonly used by actuaries -- namely, personal judgement to see whether the end results, as well as the various components thereof, seem reasonable and meet the test of common sense.

(d) The Hohm Analysis of Social Security and Fertility

Charles F. Hohm, a sociologist at San Diego State University, analyzed the independent impact of Social Security programs on fertility in various countries as against the impact of other elements which affect fertility -- namely, infant mortality, education, and per capital income. 14/ He measured the extent of a country's Social Security program by considering both the ratio of the covered population to the economically active population and the ratio of the expenditures for long-range benefits per capita of the covered population to the average wage in manufacturing. He then subjected the resulting data to multiple regression analysis, with the fertility rate being the dependent variable.

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The two hypotheses that Hohm tested were as follows:

(1) The coverage of a country's old-age or retirement, invalidity, and survivorship programs will vary inversely with that country's subsequent fertility.

(2) The benefit level of old-age, invalidity, and survivorship programs will vary inversely with subsequent levels of fertility.

By his elegant mathematical operations, Hohm shows what might be expected from general knowledge of the subject matter and a priori reasoning -- namely, that countries with extensive Social Security systems and high levels of benefits have low fertility and vice versa. However, the fact that high correlation exists does not by any means prove that there is really cause and effect between these elements. From a very simplistic approach, does it seem very likely that merely the establishment of a retirement system will affect the fertility outlook of the child-bearing population, because its members will no longer see the necessity of producing progeny who will hopefully support them in their long-distant old age?

It seems more reasonable to believe that the many factors involved in a nation being able to have an extensive Social Security system -- primarily, having changed from an agricultural economy to an industrialized one -- also independently affect its level of fertility. The application of sophisticated mathematical-statistics tools, with too little application of common sense and practical reasoning, can overemphasize the validity and significance of the results derived. This particular example is only one of many that could be pointed out, where the actuary as a practical person would not go through vast mathematical processes (of which he would be quite capable) to "prove" what is really obvious in a general sense, but is not quantifiable.

(e) The Killingsworth Argument as to Economic Assumptions for Actuarial Cost Estimates for OASDI

Charles C. Killingsworth (an economist at Michigan State University) and Gertrude Schroeder (an economist at Johns Hopkins University) argued in 1951 that the economic assumptions then used in the actuarial cost estimates for OASDI system should be "realistic". 15/ By this, they meant that the level-earnings assumption utilized for the long-range future should be replaced by an increasing-earnings assumption. The basis for their argument was that there had been such a trend in the past, and it would almost certainly continue in the future.

Furthermore, Killingsworth and Schroeder alleged that, by making a level-earnings assumption, the actuarial cost estimates overstated the cost of the program and thereby prevented desirable benefit liberalizations which would be possible if "realistic" assumptions were used. They had expressed these views earlier when they were with the Social Security Administration, as had also other economists at various times.

Admittedly, a realistic view of likely future earnings trends would be that they would be upward. It is also true that, because of the weighted nature of the OASDI benefit formula, the use of an increasing- earnings assumption would result in significantly lower long-range costs for OASDI, measured in terms of percentages of taxable payroll. But the fallacy of this line of reasoning is that it involves a serious lack of consistency among the various assumptions used, a trap into which economists often seem to fall. 16/

The weighted benefit formula prescribed in each amendment to the Social Security Act before the automatic-adjustment provisions were incorporated in 1972 (which will be dealt with later) was founded on the economic situation prevailing at the time the amendment was enacted. To have used such a static benefit formula with dynamic economic assumptions would clearly have been inconsistent and illogical. Such procedure would contain the tacit -- or, at least, not apparent -- assumption that benefit levels would gradually decrease over time relative to wages, an impossible situation from both political and social justice viewpoints. Such a decrease results from the weighted nature of the static benefit formula and is, of course, the other side of the coin from the concomitant decrease in the cost of the program mentioned previously. For these reasons, as Chief Actuary of the Social Security Administration, I always successfully opposed efforts to introduce dynamic economic assumptions into a system with a static benefit formula.

If dynamic economic assumptions were to be used in the OASDI cost estimates when the benefit formula in the law was on a static basis, the only proper thing that could be done would have been to make some assumptions as to how Congress would liberalize the benefits in future years to keep them up to date with changing economic conditions. This would have been fraught with difficulties, not merely in making appropriate assumptions, but equally importantly in risking the wrath of Congress by appearing to steal their prerogative in deciding future benefit changes.

Instead, it was preferable to use static earnings assumptions with a static benefit formula and to explain that the significant figures in the cost estimates for OASDI were the percentage-of-payroll ones, rather than those in terms of dollars.

Somewhat in contrast to this, it may be noted that the cost estimates for the Hospital Insurance (HI) program have, since 1969, used increasing-trend assumptions as to earnings in estimating tax income and as to medical costs in estimating the cost of the service benefits. These estimates also assumed that the maximum taxable earnings base would be kept up to date with the rising earnings level through periodic congressional action.

How did that situation occur for HI, which I opposed for OASDI?

There is a significant difference between these two programs. For HI, no assumption of changes in benefit provisions needed to be made (since these are service benefits), whereas this would have been essential for OASDI (because the cash-benefit formula would have been unsatisfactory under conditions of rising earnings).

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When HI was legislated in 1965, Chairman Wilbur D. Mills, in order to make the cost estimates conservative, suggested using rising-earnings assumptions and rising medical-cost assumptions, but not making any assumption as to the maximum taxable earnings base changing. Later, in the 1969 estimates, it was decided to be consistent and assume that the earnings base would keep pace in the future with the general earnings level.

In hindsight, it would have been better (and more consistent) to have used a level earnings assumption for the estimates of HI taxes (and hence a fixed earnings base) and a built-in future differential increase for medical costs representing the excess rate of increase of such costs relative to earnings. This procedure would have produced the same results insofar as costs relative to payroll are concerned.

When the 1969-71 Advisory Council was considering the cost-estimating procedures for OASDI, it unequivocally recommended using increasing-earning assumptions. 17/ Such a procedure was quire consistent with the automatic-adjustment provisions that the council also recommended. However, the council stated that such dynamic assumptions should be used even if the static-benefit-formula basis was continued, but that then the assumption should be made that Congress would keep the benefits up to date with changes in the general price level.

The council noted that, in the past, the actuarial gains resulting from using level-earnings assumptions and updating them from time to time were more than sufficient to finance cost-of-living changes and that this would be the case in the future too. In this respect, the council stated (page 86):

> To base contribution rates on estimates that assume that earnings, prices, and benefits will remain level is, in practice, to assume that as earnings and prices do, in fact, rise, the Congress will act not merely to maintain the purchasing power of the benefits but to provide for real increases in benefit levels.

This is clear evidence that the council believed (as did many others) that the automatic-adjustment provisions would, at the least, be self-financing -- as they would have been under the economic conditions prevailing in the 1950's and 1960's. Not foreseen was the effect of the economic conditions of the 1970's, which -- especially their possible future continuance -- have produced serious financing problems for OASDI. 18/

(f) The Samuelson Concept of Actuarial Soundness

Paul A. Samuelson, an economist at Harvard University, presented some unique views as to actuarial soundness and the financing of OASDI in his column in Newsweek for February 13, 1967:

> The beauty about social insurance is that it is actuarially unsound. Everyone who reaches retirement age is given benefit privileges that far exceed anything he has paid in. And exceed his payments by more than ten times as much (or five times, counting in employer payments).

> How is this possible? It stems from the fact that the national product is growing at compound interest and can be expected to do so for as far ahead as the eye can see. Always there are more youths than old folks in a growing population. More important, with real incomes growing at some 3 percent per year, the taxable base upon which benefits rest in any period are much greater than the taxes paid historically by the generation now retired.

Certainly, this is not the correct view of actuarial soundness as it applies to social insurance, at least as actuaries would generally define the concept. Even more importantly, Samuelson erred in believing that OASDI possesses a Ponzi-type magic machine powered by perpetual-motion fuel. Less than 10 years have passed since Samuelson made this statement, and yet OASDI is having financing problems that are caused in part by the slackening of both population growth and national-product growth.

(g) The Teeters Study of Cyclical Sensitivity of OASDI Beneficiary Rolls

Nancy Teeters, an economist at Brookings Institution and previously with the Bureau of the Budget, included in an overall study of federal expenditures as they are affected by changing economic conditions an analysis of the effect of different levels of national unemployment on the size of the OASI beneficiary roll. 19/ The analysis was carried out by elaborate mathematical procedures using regression equations applied to beneficiary data for 1958-70. The conclusion reached by Teeters was that about 2.7 million more OASI beneficiaries (i.e. exclusive of DI beneficiaries) would be on the benefit rolls at the end of 1973 if the national unemployment rate remained at 6.0% during the year instead of at the 4.2% rate which prevailed at the beginning of 1970.

On the very face of it, this estimate could not be correct because the estimated 2.7 million increase in the beneficiary roll is of about the same magnitude as the maximum possible increase if all eligibles ceased employment and drew benefits (or if the earnings test were eliminated, and all eligibles then claimed benefits). Certainly, a difference in unemployment of 6.0% versus 4.2% could not produce such a rise in the beneficiary roll.

The common-sense actuarial approach would be first to determine the total eligibles not in receipt of benefits. From this, there could be estimated the proportions who would claim benefits at various levels of unemployment.

A study issued by the Social Security Administration 20/ analyzed the Teeters study in depth and showed why the data used in the regression were not adequate. This was because of not considering a number of relevant factors, such as demographic changes, and the structure of the OASDI benefit provisions, particularly the earnings test, and their changes over time. The SSA study, however, did not indicate the proper actuarial method or the inapplicability of the regression approach even if adequate data were available (if this were ever possible, considering the vast number of pertinent factors involved in the matter).

(See end of Discussion Note for footnotes)

A study by Thompson and Van de Water of the Department of Health, Education, and Welfare (to be discussed later) also refuted the conclusions of the Teeters analysis that unemployment could have a drastic effect on the size of the beneficiary roll. They stated that "a two percentage point increase in unemployment of two years' duration will increase the number of retired workers by 176,000 persons or 1.0 percent." This comes as no surprise to actuaries familiar with the operations of the OASDI system.

This particular case well illustrates the weakness of blindly relying on elegant econometric procedures and disregarding standard accepted actuarial procedures and plain common sense in looking at the results of any mathematical process in the light of everyday reasonableness.

(h) The Thompson-Van de Water Short-Range OASDI Estimates

A report prepared by Lawrence H. Thompson and Paul N. Van de Water, economists in the Office of the Secretary, Department of Health, Education, and Welfare, presented the results of a study of the operations of the OASI and DI Trust Funds during 1972-77 under various alternatives as to economic conditions during that period. 21/ The analysis was based on simulations of a multi-equation model using quarterly data for 1965-73.

Regression equations were developed from the actual data for 26 different beneficiary categories so as to estimate the numbers of beneficiaries in various years. 22/ Similarly, average benefits are estimated (for new claimants, the questionable procedure of basing average benefits on a function of the primary insurance amount of several hypothetical cases is used, rather than the actuarial approach of considering all retirees). Finally, income items are estimated from 10 equations involving total earnings, national income, total employment, administrative expenses, interest rates,etc.

I seriously question whether this regression-equation method of estimating OASDI short-range costs is proper. Certainly, it seems too mechanistic and too dependent on overly broad assumptions and groupings -- despite the "scientific" appearance. In fact, economists these days tend to rely heavily on regression analysis (which is really only elegant correlation theory) -- often learning only how to do it, without understanding either the underlying mathematical basis or its limitations. Too often, it is not realized that correlations can only disprove relationships, not necessarily prove them. Then too, the model-building techniques so popular with economists currently have hardly been shown to be outstanding in projecting or planning for the overall economy! I would instead have a much greater feeling of reliance on figures developed according to the standard actuarial methods or projecting the many factors and elements involved by dealing with small cells by age, sex, and other characteristics.

Thompson and Van de Water validated their methodology by comparing their estimates for the fourth quarter of 1974 (based on projecting the 1965-73 actual data) with the actual data for that quarter. The results for the 18 major items estimated (various numbers of beneficiaries, average benefit amounts, net contribution incomes, and trust-fund assets) showed relative variations ranging from 0.2% for one item to 5.2% for OASI taxes and 7.8% for DI taxes, with a mean of 1.9%. These authors are to be praised for

this testing, because frequently theoreticians talk only in abstruse terms and never get down to the real world of actual operations (although leaving the inference that their conclusions are quite transferable to it).

I believe that an actuary could make better "armchair" estimates using only the month-by-month data up through December 1973 and his knowledge of the changes in the program in 1974. Quite naturally, an even better estimate could be made using the detailed actuarial procedures customarily followed by the SSA actuaries in their preparation of the short-range cost estimates contained in the annual Trustees Reports. There, they are required to make a single set of estimates and thus must decide on a single set of economic assumptions, rather than indulging in the luxury of a range of sets from which the best fit can be selected in retrospect. Actually, for fiscal year 1974 (July 1973 through June 1974), the estimates made by the Office of the Actuary in midyear varied less than 0.6% from the actual experience for all four items, OASI benefits and taxes and DI benefits and taxes.

Who Should Have the Responsibility for Cost Analyses and Financing Aspects of Social Security Programs?

We now come to the point of this paper. It will come as no surprise to the reader, in view of the foregoing examples of the work of economists who have entered the fields of cost analysis and financing aspects of the OASDI system, to learn that I believe that there is no primary role there for others than actuaries. By ability, training, and experience, only actuaries have the capability to do this job. Certainly, economists (as well as others, such as demographers) can profitably be consulted or can offer valid advice and criticism on certain aspects, but actuaries should have the final responsibility. However, to have and to hold such responsibility adequately, the actuary should have a good basic knowledge of economics, especially in the areas involved.

I believe that actuaries -- and only actuaries -- are appropriately qualified to prepare long-range cost estimates for any type of Social Security program. Quite obviously, not every actuary can immediately step forth and make such cost estimates on the spot. But with study and experience, an actuary could do so over the course of time. What is essential, however, is the existence of the actuarial skills on which to build.

Perhaps a somewhat less strong case can be made for actuarial exclusiveness in connection with cost analyses for short-range programs such as unemployment insurance, temporary disability benefits, and national health insurance. I believe that, in these areas, actuaries should have the primary responsibility for cost analyses. Naturally, an actuary so involved would need to have considerable background in areas not specialized in by all actuaries.

Too often, cost analyses for national health proposals are made by persons whose prime qualification is that they are interested in a proposal and have had some training in economics. It seems to me that, in this area of benefit cost estimates, there is no substitute for the mathematical training and practical insight possessed by actuaries.

(See end of Discussion Note for footnotes.)

It would be most unfortunate, if the United States is to have a national health benefits plan of some type, if the necessary cost analysis on which it is based were developed without primary reliance being placed on actuaries. This can occur either through lack of knowledge by the policy planners and legislators of the role and abilities of actuaries in this field 23/ or through the unavailability of the necessary actuarial talent. In either case, the actuarial profession has the responsibility to see that such a situation does not occur.

When it comes to the financing of social insurance systems, actuaries do not have the sole role, although they should always play an important part. The reasons for this are their knowledge of the cost estimates on which the financing is based and their general familiarity with pension plans, insurance, and employee benefits, especially their financing. Actually, the financing basis -- within the numerous alternatives possible under the results of the cost estimates -- can be considerably affected by political, economic, and even psychological factors. So, the financing decisions can well be made as a result of consideration of the matter by politicians, policymakers, economists, and other fiscal and administrative experts, in conjunction with actuaries.

The subject of the impact of social insurance taxes on the economy is, of course, in the primary field of the economists. In turn, if it were possible to make reasonably precise determinations in this area in the real world, rather than with econometric models based on a wide variety of assumptions (many of which are very rough or arbitrary), the results could be helpful in making decisions as to financing procedures. I seriously question, however, whether such precise determinations can be made. In any event, the economist attempting to work in this area should always utilize the help of an actuary, so as to steer away from the hidden shoals that lurk in the waters of the cost estimating and financing aspects of social insurance.

Footnotes

1. One outstanding example of this is the report "An Actuarial Audit of the Social Security System," prepared by Robert S. Kaplan and Roman L. Weil under contract for the U.S. Department of the Treasury, September 1974. This report was discussed in the April, September, and November 1975 issues of The Actuary.

2. It may be noted that the prestigious S.S. Huebner Foundation for Insurance Education and of the Wharton School, University of Pennsylvania, equates Fellowship in the Society of Actuaries with a Ph.D. in connection with eligibility for its research grants.

3. For an extensive discussion of why social insurance is properly considered to be "insurance", see Robert J. Myers, "Is Social Security Really Insurance?", CLU Journal, July 1974; a more condensed discussion is given in Robert J. Myers, Social Security, (Richard D. Irwin, Inc. 1975), pages 11-14.

4. J. Douglas Brown, An American Philosophy of Social Security: Evolution and Issues, (Princeton University Press, 1972), page 84.

5. John A. Brittain, The Payroll Tax for Social Security, (The Brookings Institution, 1972).

6. The question might also be raised as to whether all taxes (such as sales tax, gasoline tax, etc.) should be graded by income instead of depending solely on the amount of the purchase.

7. For an extensive discussion of the matter of tax regressivity in OASDI, see Robert J. Myers, "Social Security Taxes: Regressivity and Subsidies", Tax Foundation's Tax Review, December, 1973; a more condensed discussion is given in Robert J. Myers, Social Security, (Richard D. Irwin, Inc., 1975), pages 203-205.

8. Martin Feldstein, "The Optimal Financing of Social Security," Discussion Paper No. 388, Harvard Institute of Economic Research, November 1974. Other papers of his along these lines are "Social Security, Induced Retirement and Aggregate Capital Accumulation" (Journal of Political Economy, 1974) and "Toward A Reform of Social Security" (The Public Interest, Summer 1975).

9. For more details, see Robert J. Myers, "Hitting the Bull's-Eye", The Actuary, November 1975.

10. For more details see Robert J. Myers, Social Security, (Richard D. Irwin, Inc., 1975), pages 143-144.

11. See the 1975 OASDI Trustees Report (House Document No. 94-135), page 29.

12. This proposal of the Nixon Administration was passed by the House of Representatives (H.R. 1). It would have established what was essentially a guaranteed annual income plan for all families with children (similar to the Supplemental Security Income plan for the aged, blind, and disabled actually enacted in 1972). The Family Assistance Plan was not enacted.

13. For more details, see "Staff Data on H.R. 1: Analysis of Cost of Committee Bill", Committee Print, Committee On Finance, United States Senate, June 12, 1972 (page 27).

14. Charles F. Hohm, "Social Security and Fertility: An International Perspective", Demography, November 1975.

15. Charles C. Killingsworth and Gertrude Schroeder, "Long-Range Cost Estimates for Old-Age Insurance", Quarterly Journal of Economics, May 1951.

16. Similar common trap is the valuation of a stream of future earnings of an indivuidual, such as in court damage suits, where no attempt is made to obtain consistency between the assumed annual rate of increase in earnings and the interest rate used for discounting purposes. Also, see "1972 Lifetime Earnings by Age, Sex, Race, and Education Level", Research and Statistics Note No. 14-1975, Social Security Administration, Sept. 30, 1975, where future earnings on a static basis are discounted at rates ranging from 2% to 8% (presumably because these are "reasonable" interest rates being earned currently).

17. "Reports on the Old-Age, Survivors, and Disability Insurance and Medicare Programs", 1971 Advisory Council on Social Security, Department of Health, Education, and Welfare, 1971 (pages 85-87 and 124-126).

18. For more details see Robert J. Myers, Social Security, (Richard D. Irwin, Inc., 1975), pages 167-173 and 341-351 and Geoffrey N. Calvert, New Realistic Projections of Social Security Benefits and Taxes (New York: Alexander and Alexander, Inc., 1973).

19. N. Teeters, "Built-in Flexibility of Federal Expenditures", Brookings Papers on Economic Activity, 3:1971, Brookings Institution, January 1972.

20. Kenneth Sander, "The Cyclical Sensitivity of OASI Beneficiary Rolls", Research and Statistics Note No. 20-1974, Social Security Administration, July 22, 1974.

21. "The Short-Run Behavior of the Social Security Trust Funds", Technical Analysis Paper No. 8, December 1975.

22. An indication of the methodology can be seen in the Appendix, which reproduces the first part of Appendix I of the Thompson-Van de Water report, showing the estimating equations for the first two beneficiary categories, male primary beneficiaries aged 62-64 and such beneficiaries aged 65 and over.

23. It should go without saying that the actuary is not a mere computer who is reliant on others for the basic assumptions used or that the actuary is devoid of knowledge of financing, benefit design, and even administrative matters!

APPENDIX

Illustration of Estimating Equations Used by Thompson and Van de Water*

For the purposes of estimating the number of retired worker beneficiaries, retired workers are divided into four age/sex groups: Males, females, workers under age 65, and workers aged 65 and over. Except in the case of the younger males, the number of retired workers is estimated by explaining the ratio of workers in current payment status to the estimated total number of "insured workers" -- i.e. workers eligible for benefits. The fraction of the males aged 62 through 64 who are insured for retirement benefits is so high and varies so little during the estimating period that these workers are estimated by explaining the ratio of retirement beneficiaries to the total male population aged 62 through 64.

The estimating equations follow. All are estimated by ordinary least squares. Standard errors are shown in parentheses.

*From pages 27-28, Lawrence H. Thompson and Paul N. Van de Water, "The Short-Run Behavior of the Social Security Trust Funds", Technical Analysis Paper No. 8, Department of Health, Education, and Welfare, December 1975.

Male retirees aged 62 through 64:

$$\begin{aligned}RMRET62(t) = {} & 0.0580 + 0.1953\ RMPIA(t-1) + 0.2259\ RMPIA(t-5) \\ & (.0102)\quad (.0331)\qquad\qquad (.0357) \\ & + 0.0058\ UE\ (t-2) + 0.00396\ UE(t-6) + 0.0184\ D73(t) \\ & (.0013)\qquad\quad (.00110)\qquad\quad (.0033)\end{aligned}$$

B BAR SQ = .983 SF = 0.0038 DW = 1.98 1966:3 - 1974:3

RMRET62(t) ratio of male retirees aged 62 through 64 with a benefit in current payment status at the end of the quarter to the population of males aged 62 through 64 at the end of the quarter.

RMPIA(t) ratio of the constructed male primary insurance amount that would be awarded to an individual retiring in quarter t to the average spendable earnings of non-agricultural production workers during quarter t. The constructed male PIA is a weighted average of the PIA that would be awarded a 62-year old man, a 64-year old man, a 65-year old man and a 70-year old man, each man retiring during the quarter after having always earned the median wage for all covered males in wage and salary employment. The actual or predicted average benefit is not a proper explanatory variable for the number of retired worker beneficiaries since it is not exogenous. As is seen in later equations, a change in the number of beneficiaries affects the average benefit payment.

UE(t) The average total unemployment rate during quarter t (in percent).

D73(t) a dummy that takes the value 0 in all quarters prior to 1972:2 and the value 1 in all subsequent quarters. The liberalization in the earnings test which became effective at that time increased the number of working persons receiving social security retirement benefits.

Male retirees aged 65 and over:

$$\begin{aligned}RMRET65(t) = {} & 0.3805 + 0.0872\ RMPIA(t) + 0.0094\ D73(t) + 0.00156\ UE(t) \\ & (.1194)\quad (.0357)\qquad\quad (.0034)\qquad\quad (.00097) \\ & + 0.05405\ RMRET65(t-1) \\ & (.1425)\end{aligned}$$

R BAR SQ = .952 DW = 2.18 SE = .0034 1966:2 - 1974:2

RMRET65(t) ratio of male retirees aged 65 and over with a benefit in current payment status at the end of the quarter to the number of males aged 65 and over who are insured for retirement benefits.

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MR. MYERS: It is only fitting that we should consider the roles played by economists and actuaries in the field of social insurance in the very heartland of economists. For better or worse, Ph.D.'s in economics hold a hallowed position here in our nation's capital. Some might well add, though, that in recent times their halos have tended to slip.

I am certain that many in this audience realize that I have some rather strong views about economists and their work in the Social Security field, particularly as to cost estimates and related elements. My Discussion Note in connection with this session goes into considerable detail in this respect.

A very interesting new sally of economists into the Social Security field recently occurred when Professor Otto Eckstein of Harvard University (formerly a member of the Council of Economic Advisers) testified before the Senate Budget Committee. He advocated a one-time transfer of $5 billion from general revenues to the OASDI trust funds, so as to prevent the decrease in the fund balance this year and thus preserve public confidence.

He stated that, under the unified-budget concept, this would be purely a paper transaction and would not at all affect the balance of the budget as relating to payments to and from the public. This is, of course, true. But think what delightful effects on the budget balance could be produced, without necessarily affecting the rights or obligations of anybody, if our private pension plans and insurance companies were all nationalized,and their operations were left unchanged but made part of the federal budget! What federal surpluses we would have! And yet what would have been changed or accomplished, other than the administrative features? Perhaps then, with the huge and -- from some people's viewpoint -- undesirable surpluses each year, we would be required to remedy the situation by greatly increased federal spending!

Turning back to the Eckstein proposal, what is left unmentioned is that the National Debt would be increased by $5 billion, and resultantly the interest servicing thereof would be increased by about $300-400 million each year in the future. It could be argued that this interest too is unreal, being solely a paper transaction, but in some way the cost of Social Security outgo in excess of tax income must be met.

Economists at times argue that the fiscal drag produced by increasing the payroll taxes will be harmful, but they neglect to mention that letting the trust funds decrease involves a fiscal drag too because money is then drawn out of the economy to purchase the government debt obligations sold by the trust funds to the general public, directly or, generally, indirectly. Economists can have great intellectual exercise debating the relative effect of these two types of fiscal drag, but they are really not measureable with any degree of precision.

The Wall Street Journal,with tongue in cheek, has suggested that the Eckstein "magic solution" to OASDI's short-range financing problems could well be applied to its long-range problems as well. The solution would be to appropriate $2,100 billion, instead of $5 billion, from the general fund to the OASDI trust funds and thereby pay off all its unfunded liabilities. It would be argued that this would have no real effect on the federal budget or anything else, "because it would be only a paper transaction". As a result, it is stated, people would feel better because OASDI would be so well funded, instead of being bankrupt.

Our panel consists entirely of actuaries, although all members have had extensive experience and dealings with economics and economists over the years. It can well be said that they have a reasonable knowledge of economics, gained through both academic courses and experience.

Perhaps at some later date, we should have a session similar to this with economists participating and, if necessary, defending themselves against any adverse criticisms that might be made. This present session should serve the purpose of acquainting actuaries with the problems involved in the interrelationship of economists and actuaries in the social insurance field. From that foundation, we could then perhaps, go on at another meeting to have direct interplay between the two professions.

MR. JOHN T. BIRKENSHAW: The Canadian Institute of Actuaries (CIA) was formed in 1965. Shortly thereafter, the Canadian and British Insurance Companies Act was modified to define an actuary as a Fellow of the Canadian Institute of Actuaries. (In accordance with the Act, all annual statements must have an actuarial certificate stating that the reserves of the company are sufficient to meet the future obligations and also to meet the legal obligations of the Canadian and British Insurance Companies Act.)

The initial membership of the CIA was made up of all the members of its forerunner, the Canadian Association of Actuaries. These members were designated as Fellows of the Institute. Additions to membership were limited to any person who was a Fellow of the Society of Actuaries (U.S.A. and Canada), the Institute of Actuaries (Great Britain), the Faculty of Actuaries (Scotland), or by examination of the Casualty Actuarial Society (U.S.A. and Canada). Associates of the Society qualified before May 1, 1965, were admitted to membership when the Institute was established and, of these, those with 10 or more years of actuarial experience and a substantial amount of actuarial work in Canada could be designated as Fellows. As time has gone on , the Membership Committee of the Council has become somewhat more strict in adherence to rules pertaining to residence in Canada and/or to actuarial work relating to Canadian operations and statutes. Most recently, as the syllabus of the Society of Actuaries has been modified to provide for a Canadian section to Part 9, it will now be essential to pass such Canadian specialty section in order to become a Fellow of the CIA. Basically. however, it seems clear that the CIA has established the principle that admission can only be gained through the attainment of fellowship in one of the highly recognized actuarial bodies. I believe this is consistent with the Federal recognition of the Canadian Institute of Actuaries.

Canadian economists, on the other hand, do not appear to have any recognized professional organization with specific examination requirements or guides to professional conduct.

The Province of Ontario, which employ some 70,000 people, has economists in virtually every one of the 26 departments of the Government. An economist, for purposes of filling these positions, is referred to as an individual having a 4 year university course with a major in economics. I would like to quote to you what one professor, from the University of Toronto, felt he would consider the qualifications necessary to be an economist.

The educational processes involved in becoming an economist are as follows:

1. A 4 year course in economics at a university (the time may vary with the university)

2. A Masters degree in economics

3. A Ph.D. in economics

> The point in this process at which someone may call himself an economist is rather vague. In my opinion, a person isn't really an economist until he has earned his Ph.D., but lots of people with Masters' degrees, if they work in the field, are called economists.

A professor at another university indicated somewhat the same qualifications, but felt it was not necessary to have a Ph.D. He also said:

> There isn't any sort of disciplinary body to police the activities of economists. Unlike actuaries or doctors, who have to produce extremely exact results, the work of an economist is not so easily identified. Economists are judged by other economists on the work they submit for publication.

MR. HOWARD YOUNG: I will discuss this from a different point of view; that is, in terms of the kinds of problems with which each profession is concerned.

As a preliminary, it should be noted that economists are a much more varied group than actuaries. The economists are more frequently generalists, and there appears to be some tendency for some economists to dabble in social insurance matters without studying all of the details involved. Nevertheless, there are many who do their work carefully, and we should confine any comparison of the groups to individuals who are prepared to do the work needed to understand the subject.

Actuaries are primarily concerned with the development, and management, of programs that involve different -- but equivalent -- cash flow streams, and which involve uncertainty. Our focus is primarily on the financial aspects, including the management of any temporary balances that develop due to different time incidence of the cash flows. In order to do that well, we get into many other aspects of the program: e.g., contract provisions, plan design, etc.

Economists are primarily concerned with two other kinds of questions. (Note that economics has been defined as the study of how scarce resources are allocated.)

The first type of question is the effect on behavior (with respect to that allocation) of various types of incentives, primarily cash (e.g., wages, prices, taxes, etc.). The second type of question is called welfare analysis: which allocations are better than others; and how is that decision made? Two illustrations may help clarify the ideas. Actuaries have long been concerned with anti-selection; this is a behavior issue to economists, i.e., the availability of insurance at incorrect rates will stimulate certain types of behavior by potential insureds. An insurance-related welfare issue is: why is it better -- if it is -- to trade a lump sum for a lifetime series of payments, if the latter has an expected value equal to the lump sum?

As a general comment, economics is less mathematical -- and especially less numerical -- than actuarial science. Econometrics is relatively new, and is essentially correlation analysis; but so are our mortality tables! My own experience is that economists are less adept than actuaries at sensing the implications of numerical relationships, but there are significant exceptions to that generalization. Economists have less experience in handling

large bodies of data. Also, because the data usually are not "clean" and not available in large blocks that are consistent, economists make many simplifying assumptions that often are ignored when the results are discussed. Economists are usually concerned more with the direction of effects (e.g., will there be more, or less) than with their amount.

It is useful to briefly consider some concepts that are looked at differently by the two professions.

Interest is treated by actuaries as an adjustment for the different times when nominal values apply. Economists analyze interest in terms of an incentive for individuals to defer the use of money.

Another illustration is that both professions recognize that there are significant differences between individual and group activity. Thus, actuaries point out that an individual cannot self-insure against a risk;a group of individuals exposed to risk can self-insure. Economists point out that, although individuals can rearrange the time flow of their incomes, a nation cannot do that (unless it enters into credit arrangements with foreigners).

Finally, related to the point just noted, I will make a few comments on the Eckstein suggestion referred to in Myers' opening remarks. I suspect that Eckstein was engaging in an educational effort to point out the financial non-significance of converting OASDI legislative commitments into contractual commitments (i.e., government bonds). His suggestion must be considered in terms of the President's proposal -- as part of a broader scheme -- of two related items: raise payroll taxes and reduce income taxes. The additional payroll tax payments would go to the Treasury -- which would issue bonds to the OASDI Trust Fund -- and then back to taxpayers through income tax reductions (but with a different distribution among individuals, as compared with the payroll taxes). The net result therefore would be: more contractual promises in the Trust Fund, and a redistribution (but not a change in the aggregate amount) of money in the private economy. Another -- and, in this case, minor -- result is more interest income in the future to the Trust Fund. Since interest payments usually come from general revenue, the distribution of Trust Fund income would shift slightly from payroll taxes to general revenue sources.

To explore the subject further, consider whether the following ideas are technically correct, without regard as to whether you agree with the political implications. What if a large block of bonds, which were non-interest-bearing, and could be paid for only from payroll taxes, were issued to the Trust Fund? Would there still be a large "unfunded liability" or would this formalization of the Treasury's role as intermediary between FICA and OASDI make it a fully funded plan (and, hence, more actuarially sound)? What if those bonds were interest-bearing, with the interest payable from general revenue; then -- as noted above -- Trust Fund income would shift from payroll taxes to general revenues. What if the bonds were not dependent only on payroll taxes; then even more potential to shift to general revenue would exist.

To summarize: economists have broader concerns, but are not as knowledgeable about the financial aspects as actuaries, since the latter specialize in those matters. We must learn to complement/compliment each other's skills, rather than compete for jurisdiction.

MR. JAMES L. COWEN: Actuaries and economists involved in social insurance programs require training not always needed by actuaries working for insurance companies or in the consulting fields. A knowledge of the political processes is an absolute necessity as is a good working relationship between actuaries, sociologists, economists, and administrators. Some training in being able to read and interpret legal language and the ability to work with the legal profession is desirable, just as it is for most of the actuarial profession.

At the beginning of every Congress, there are a large number of bills introduced to amend the Social Security and Railroad Retirement programs, and the agencies are requested to file a report on most of the bills even if the bills are not expected to get serious consideration. The preparation of these reports is done jointly by many professions within the agency. The actuary is responsible for the cost aspects. In writing his part of these reports, the actuary must take care not to cause either political problems or problems of consistency with reports on other bills. I remember an occasion when an allowance for accelerated retirement due to increased benefit rates was specifically mentioned in the Railroad Retirement Board's report on a bill. At the hearing, this one item became the focal point for much of the discussion. As a result, more pertinent concerns were never discussed.

For bills which are considered seriously, representatives of the agencies must testify before congressional committees. At these times, technicians accompany the heads of the agency and often testify concerning the proposals. The actuary is frequently asked economic questions and, therefore, must have a knowledge of the economic aspects. The actuary is sometimes also asked questions which are in the realm of the sociologist.

In my estimation, an actuary working in social insurance programs must have significant training in economics, sociology, and political science, and also the ability to communicate with laymen. These may be as important as formal actuarial training in giving him the tools to accomplish the job which needs to be done.

MR. BIRKENSHAW: I have never known a social insurance program operated by a government to be short-range. Such programs seem to have the happy faculty of growing by leaps and bounds regardless of everyone's good intentions. The Canada Pension Plan (CPP), of which I am now the Vice Chairman of the Advisory Committee, was designed during the years 1963 and 1964, and finally implemented in 1965. Thus, it has had only 10 years of experience, as opposed to the U.S. Social Security program, which has had 40 years of experience.

Earlier this year, Myers wrote an article in The Actuary, indicating that he was very proud that, in 1935, the actuaries had projected a fund of $45 billion for OASDI in 1975. In fact, the fund reached $47 billion in that year, representing an error of less than 5%. As he pointed out, this seemed to be a truly great projection. However, the contributions to the fund and the benefits paid by the fund were in the order of $60 billion, approximately 25-30 times the original 1935 estimate.

The same conclusions can be drawn with regard to the CPP. Already, after only 10 years' experience, the contributions and the size of the fund are

almost twice the original projections. The benefits are significantly greater, but only represent a 50% increase. It is not very difficult to determine the reasons for some of these changes. As an economist with the Canadian Council of Social Development recently said, "The Canada Pension Plan was designed to be a vehicle for providing capital funds to the provinces to finance economic development as well as to be a social insurance program."

It is easy to see that, if the object of the plan is to develop cheap money for the provinces, it is difficult, if not impossible, to make long-range forecasts of the so-called costs of the program. Every year in Canada, there is an actuarial study which has been very highly regarded and very informative on the subject of the benefit payments and administrative costs of the plan as it is presently conceived. These studies take into account the present levels of contributions and estimates pertaining to the rate of inflation of earnings and the Consumer Price Index as well as an interest rate on new investments. The studies have been subject to criticism because they do not necessarily modify the rates of inflation with year-to-year results. They have proven that, over the last 35 years, the differential between prices and incomes has remained relatively stable and this is the prime factor, based upon the present benefit structure and contribution rates, affecting the final balance in the fund.

The same economist who cited the fact that the plan was originally formed with equal emphasis on capital accumulation and on benefit structure also cited that, in recent discussions with the provinces, just as many provinces designated officials from treasury departments as designated welfare department officials to carry out the work, indicating there is still as much emphasis on capital as on having a good social plan. This suggests that the choosing of alternatives as outlined in the actuarial reports was superfluous primarily because there would be considerable pressure built up to improve benefits, and there would be wide gaps in the average interest on new investments.

In fact, the report makes every effort to take into account long-term trends in mortality, morbidity, disability, survivorship, birth rates, immigration, and emigration. At the outset of the Canada Pension Plan, Judy LaMarsh, Minister of Health and Welfare at the time, said, "In a public plan, the contributor must rely upon the fact that, so long as his country exists, continuous inflow of contributions under such a plan will assure him of his benefit rights at retirement."

One of the most significant debates which will take place in Canada over the next few months or years will be with regard to the level of the fund to be built up in the Canada Pension Plan. The major point in favor of a large fund is that it will provide the provinces with relatively inexpensive, but readily available amounts of money which can, through the medium of the actuarial studies, be projected at least for a few years into the future.

The present actuarial studies indicate there will be a negative cash flow to the provinces well within the next decade. In view of the fact the fund has provided over 25% of the long term debt to the provinces over the past decade, you can well imagine that the provincial treasurers will have a great deal of input into the discussion.

I will leave it to others on the panel to debate whether the CPP contributions under these circumstances, if they are raised merely as additional capital funds, are a tax or should be regarded as part of the cost of pension benefits to Canadians.

MR. COWEN: In the United States, social insurance programs include Social Security and Railroad Retirement (both of which include Medicare), state and local programs such as unemployment insurance and retirement systems, and the Federal Civil Service Retirement system. Methods of cost estimating for Railroad Retirement and Social Security differ because the former covers a single industry which has been declining for many years, and the latter covers virtually the rest of the population of the country exclusive of Federal Civil Servants and some state and local government employees.

At present, both programs contain provisions for automatic cost-of-living adjustments of benefits and adjustments in the taxable wage base. These automatic provisions were introduced only recently, in 1972. Prior to that time, all changes in either the Railroad Retirement or Social Security programs required legislation. As a result of this legislative requirement, all cost estimates made by actuaries of both programs were made on the basis of static economic assumptions since we did not feel we should anticipate the directions in which the legislation would go. Because actual economic conditions differed from the static assumptions, the actuarial cost estimates were criticized by laymen and have been misunderstood by laymen. The 1972 report of the Commission on Railroad Retirement is a prime example of such criticism.

At present, the elements in making cost estimates which cause the greatest difficulty are the economic assumptions which include those relating to wage levels, the cost of living, and interest rates for the future. The Railroad Retirement program, in particular, has certain elements which make these assumptions rather difficult to choose. At present, the Railroad Retirement program has some automatic increases on a long-term basis and some only through 1980, with still other elements not subject to automatic increases.

Historically, all actuarial valuations for both Social Security and Railroad Retirement have been made on the basis of the law in effect on the valuation date. Thus, the question arises as to what kind of economic assumptions are to be used for a particular period, i.e., dynamic or static. The approach for the Railroad Retirement valuation now being made is to assume dynamic conditions through 1980 and static conditions for later years. Since it is impossible to make some calculations on the basis of static assumptions and some on the basis of dynamic ones, this is the most logical approach, and it is consistent with the past practice of making the valuation on the basis of current law.

The interest assumption creates a difficult problem to explain to a layman. Under static assumptions, a true interest rate should be assumed, and we have felt that this should be in the neighborhood of 3%. How do you explain this kind of interest assumption to a layman who sees that you are actually earning almost 7% on your investments? We are taking the approach that the interest rate actually earned is a true interest rate plus an allowance for the depreciation in the value of the capital. We hope that this will be recognized as valid by the layman.

Another area where we at the Railroad Retirement Board are having some significant discussions concerns the levels of future employment in the industry. Since 1952, with a few exceptions, the employment levels have been consistently declining. Some people involved are saying that they do not expect much more of a decline in employment. Some are even saying that they expect an increase due to the recent Railroad Revitalization Act and the Rail Reorganization Act, which will create a new subsidized railroad system in the northeast, taking over the operations of the seven bankrupt railroads in that area. Nevertheless, it would be more conservative to assume a lower ultimate employment level. This has caused considerable discussion among the actuaries, the economists, and the representatives of the industry, both on the management and labor sides.

The actuary also has to consider the political impact of his assumptions. For example, at the time of the 1956 and the 1970 amendments to the Railroad Retirement Act, the actuarial assumptions were attacked at the congressional hearings. In some instances, the entire testimony centered on these assumptions, and the major considerations did not get complete investigation by the congressional committees because of this controversy. Thus, it is important that the actuary for a social insurance program document the basis for his assumptions and present them in a clear and objective manner. He must retain his professionalism and be able to explain what is involved.

Historically, actuarial valuations of both the Railroad Retirement and Social Security systems have been made an open-end basis which includes an allowance for future entrants into the system. This is considerably different from what is normally done for private pensions. However, it has generally been felt that, because of the compulsory nature of a social insurance system, this is proper. Without making this projection, the amounts of the reserves and the required tax rates in the early years of the system would be so high as to make it impossible to start the program. If the Social Security system were now fully funded by reason of much higher past taxes, its assets would be roughly equal to the total value of government debt now held by the private sector. Under these conditions, most or all government obligations would be held by Social Security, and there would be few, if any, government obligations held by the private sector.

Although I am not an expert on making cost estimates for the Social Security program, I do know that its cost estimating is done on the basis of projections of the future population of the country. Fertility rates become an important aspect of those assumptions and, historically, fertility rates have fluctuated dramatically depending upon the economy and other considerations.

The Social Security system now contains provisions for automatically increasing the tax base and increasing benefits. The former is increased on the basis of changes in the average earnings in the country, whereas the latter is changed on the basis of increases in the Consumer Price Index (CPI). Over the last 50 years, wages have increased more rapidly than the CPI. Cost estimates seem to indicate that the difference between the two indices is the most important factor in evaluating what will happen to the program.

In reviewing cost estimates for social insurance programs, it must be remembered that the dollars and cents costs are not the important part, but rather the required tax rate in terms of percent of payroll. The tax rates in the law are written in terms of percent of payroll, and the valuations

are the basis for determining what those percents should be. Therefore, the question arises whether the tax rates in terms of percent of payroll would be significantly different, depending on whether the valuation is made using static or dynamic economic assumptions. In my estimation, if the replacement ratio at the time of retirement is relatively constant, and if the CPI goes up at the same rate that wages go up, then the two types of valuations should come up with roughly the same percent-of-payroll tax rates.

As well as the items which I have mentioned, there are, of course, the usual assumptions concerning rates of retirement, disability, family composition, remarriage, etc., which must be considered in making a valuation of a social insurance program.

Because both the Railroad Retirement program and the Social Security program have such a large experience, all assumptions used by their actuaries are based on the actual experience of those programs. The Railroad Retirement Board publishes a technical supplement to each of its triennial actuarial valuations which contains all of the assumptions and the experience studies on which they are based. The next such publication is expected around the end of this year for the valuation now in progress.

I have concentrated on the Social Security and Railroad Retirement programs because they are the ones for which long-term estimates are made on an open-end basis and, therefore, they are handled differently than private pension plans. Estimates for unemployment insurance are basically short-term estimates, while the Civil Service Retirement and most state and local pension plans are valued similarly to private pension plans.

MR. YOUNG: An important factor is the changing work-force participation of women. In general, we face great difficulty in predicting major shifts in social conditions and mechanisms. That does not mean that we should abandon the effort. On the contrary, it should be done on a broader scale since we now project the cost effects of OASDI for 75 years without putting that in the context of other changes.

MR. COWEN: In making short-range estimates for social insurance programs, the economists play a larger role than do the actuaries, at least in the United States. When the President submits his budget to Congress at the beginning of each calendar year, short-range projections of the income and outgo of the social insurance programs are included as a part of it. The Office of Management and Budget (OMB) directs that the economic assumptions used in these short-range projections be consistent with the economic assumptions which are used for the rest of the budget. The tables on the next two pages, which display the economic assumptions that appeared in the President's budget submitted to the Congress in January 1976, are an example of this.

Generally, the assumptions which are expounded by OMB are used in the short-range projections. The long-range projections have to be merged into these short-range estimates in order to be consistent. Social Security, historically, in the report of its Board of Trustees, has shown the short-range projections separately for the first five years, and then show the long-range projections. This kind of policy is necessary in order to avoid confusion.

SHORT-RANGE ECONOMIC FORECAST

(Calendar years; dollar amounts in billions)

Item	Actual 1974	Forecast 1975	1976	1977
Gross national product:				
Current dollars:				
Amount	$1,407	$1,499	$1,684	$1,890
Percent change	7.7	6.5	12.4	12.2
Constant (1972) dollars:				
Amount	$1,211	$1,187	$1,260	$1,332
Percent change	-1.8	-2.0	6.2	5.7
Incomes (current dollars):				
Personal income	$1,155	$1,246	$1,386	$1,538
Wages and salaries	763	802	892	1,001
Corporate profits	132	118	156	181
Price level (percent change):				
GNP deflator:				
Year over year	9.7	8.7	5.9	6.2
Fourth quarter over fourth quarter	11.4	6.3	5.9	6.3
Consumer Price Index:				
Year over year	11.0	9.1	6.3	6.0
December over December	12.2	6.9	5.9	5.9
Unemployment rates (percent):				
Total	5.6	8.5	7.7	6.9
Insured[1]	3.8	7.2	6.3	5.4
Average Federal pay raise, October (percent)	5.5	5.0	4.7	8.6
Interest rate, 91-day Treasury bills (percent)[2]	7.9	5.8	5.5	5.5

[1] Insured unemployment as a percentage of covered employment.

[2] Average rate on new issues within period; rate shown for 1976 was the current market rate at the time the estimates were made.

LONG-RANGE ECONOMIC ASSUMPTIONS
(Calendar years; dollar amounts in billions)

Item	Assumptions			
	1978	1979	1980	1981
Gross national product:				
Current dollars:				
Amount	$2,124	$2,376	$2,636	$2,877
Percent change	12.4	11.9	10.9	9.1
Constant (1972) dollars:				
Amount	$1,411	$1,503	$1,600	$1,679
Percent change	5.9	6.5	6.5	4.9
Incomes (current dollars):				
Personal income	$1,727	$1,930	$2,138	$2,331
Wages and salaries	1,126	1,259	1,397	1,525
Corporate profits	201	223	247	271
Price level (percent change):				
GNP deflator:				
Year over year	6.1	5.0	4.2	4.0
Fourth quarter over fourth quarter	5.7	4.7	4.0	4.0
Consumer Price Index:				
Year over year	5.9	5.0	4.2	4.0
December over December	5.6	4.6	4.0	4.0
Unemployment rates (percent):				
Total	6.4	5.8	5.2	4.9
Insured[1]	4.9	4.2	3.6	3.3
Federal pay raise, October (percent)	7.0	6.5	5.75	5.5
Interest rate, 91-day Treasury bills (percent)[2]	5.5	5.5	5.0	5.0

[1] Insured unemployment as a percentage of covered employment.

[2] Average rate on new issues within period.

Of course, in the short-range projections there is a greater degree of certainty with respect to the number of people who are receiving benefits and the wages which are subject to taxation than there will be in the long term. With respect to the Social Security program, the short-range projections do not have to involve fertility rates. The number of people who will be in the labor force and on the benefit rolls are functions of the current population.

Most of the discussion up to here has considered only the retirement and survivor types of benefits. Other forms of social insurance which exist in the United States deal with unemployment and short-term sickness benefits, public assistance programs, and Medicare. The Railroad Retirement Board is involved in the administration of unemployment insurance and short-term sickness programs and has a role in the administration of Medicare.

At the Railroad Retirement Board, the estimates for the unemployment and sickness programs are made on a short-term basis by economists. The Railroad Unemployment Insurance Act contains a sliding scale of contribution rates which are dependent upon the balance in the Railroad Unemployment Insurance Account as of September 30 of the preceding calendar year. Thus, the law itself contains provisions for automatically adjusting the contribution rates depending upon the experience in the preceding year. In addition, this short-range approach for unemployment insurance benefits is reasonable when we realize that benefits do not accrue into the indefinite future. Benefits under the Railroad Unemployment Insurance Act during a benefit year running from July 1 to June 30 of the following year are determined on the basis of earnings in the calendar year (base year) preceding the beginning of the benefit year. Once the benefit year expires, benefits based on the base year cease to exist as a liability. This is quite different from the approach for retirement benefits, where accrued benefits once vested continue throughout the lifetime of the wage earner.

Since unemployment and sickness programs are financed on a short-term basis, the question arises as to what kind of a reserve should be maintained. Under the Railroad Unemployment Insurance Act, the contributions as set up by the 1975 amendments anticipate a reserve equal to about three months of benefits and a maximum contribution rate of only about 10% above the average anticipated annual cost over the next five years. When these amendments were being considered, a question about the adequacy of these two items was raised, but little consideration was given to the question because the proposals had been agreed to by both railroad labor and management.

The public assistance programs pay benefits only to individuals in need. Therefore, payments fluctuate with the economy and are basically short-term types of benefits. Of course, some individuals receive public assistance payments for long periods of time, but financing can be based on short-term estimates. Thus, historically, the cost estimates have been made by economists. Casualty actuaries legitimately have a place in making these estimates.

As far as Medicare is concerned, the actuaries of the Social Security Administration have played a role in determining the contribution rates. Financing of the Hospital Insurance part of Medicare is through the regular Social

Security and Railroad Retirement tax provisions. Although these taxes are paid by individuals not generally entitled to Hospital Insurance benefits at the time, the tax rates are determined so that the program is virtually financed on a pay-as-you-go basis. As such, economic projection methods can be used as well as the standard actuarial procedures used for making computations for hospital insurance benefits under private group plans. The procedures used are spelled out in Actuarial Study No. 71 issued by the Social Security Administration in February 1970.

The Medical Insurance benefits under Medicare are paid for on an elective basis by premiums paid by the individuals entitled to benefits. The premium rate is adjusted annually based on changes in the costs of the benefits. As such, it also is on a pay-as-you-go basis and subject to change. Although the determination is made by the actuaries, the status of the economy does play a significant role.

Thus, it is seen that the short-range cost estimates in the United States have been made basically by economists, but that actuaries do play a role. Coordination between the professions is, therefore, necessary.

MR. BIRKENSHAW: With regard to short-range programs, I do not believe there is such a thing in Canadian social insurance. I would like to cite some of the history of the pension programs in Canada. In my opinion, the very definition of the word would indicate a long-range program although, as we go through the programs, you might not necessarily agree.

A recent report by the Council of Social Development cited the six-tier retirement income pension system in Canada. These six tiers are as follows: private pension plans, which I will ignore; personal savings, which I will also ignore; the Old Age Security plan; the Canada Pension Plan, which I dealt with previously; the Guaranteed Income Supplement, and provincial supplementation of retirement income.

I would agree that private pension plans, savings, and the CPP are of a long-range nature. Old Age Security was first developed in 1927, and was modified by the Old Age Security Act of 1952. This pension plan, in its original form, provided a flat amount of benefit for everyone attaining age 70 and resident in Canada. It was intended to be "a floor or protection" above which private pension plans and savings would take over. I believe it started at $40 per month to all, and is now well over $100 per month. Originally, the taxation to provide for this benefit came from sales taxation, personal income taxation, and corporate taxation. It is now part of general taxation.

These benefits, from the very outset, were to be on a pay-as-you-go basis and the accounting, therefore, was on an annual basis, with the income meeting the expenditure. By 1963, the Federal Government was of the opinion that Old Age Security was not providing adequate coverage for the large part of the population. It therefore introduced the Canada Pension Plan, a wage-related pension scheme, as an extra tier, not unlike the OASDI plan in the United States. Because of the nature of the benefits in this plan, long-range forecasts are required.

We now come to the Guaranteed Income Supplement plan. The GIS plan was introduced in Canada in 1967 to establish an interim measure of protection for those individuals already 65 years of age or over and thus not eligible for CPP. It was assumed the GIS would be gradually phased out, but already there is less talk of the GIS program being temporary. For example, in the years 1971-1972, there was an increase of 4% in the proportion of those over 65 receiving GIS. This is strictly a means-tested program, and thus more directly an anti-poverty device. However, as time has gone on,it would appear to be an increasing program rather than one that is likely to be phased out.

I leave to you to assess whether or not you regard this as a short-range or long-range program. I believe it is short-range from the point of view that estimates are made from year to year as to the costs of the benefits to be derived from general taxation, but I suspect it is becoming a greater part of our system of social benefits.

Finally, we have the provincial supplementations of retirement income, some of which have now been formalized. I will not go into these, but suffice it to say each province has its own method of providing supplementary incomes.

The two other major programs which seem to require the most attention in Canada are unemployment insurance and health insurance.

With regard to unemployment insurance, this is a federal scheme, with the taxes being derived from employers and employees on a payroll deduction basis. When the plan was introduced, there was a great deal of controversy about the possibility of overinsurance and thus the promotion of malingering. In this area, although the actuarial advice was largely ignored, the experience in the field of group insurance with disability plans, etc. was very beneficial. There is little doubt that the program as originally designed, with a maximum benefit of $100 per week, was very liberal. Now the maximum benefit has risen to $133, based upon maximum insurable earnings of $200 per week in 1976. The benefits have become much more liberal with the new Act, and the Act provides for benefits for loss of earnings in the event of sickness, pregnancy, or retirement where the individual has at least 20 weeks of insurable employment in the last 52 weeks.

Plans of this kind that are so dynamic from the point of view of the number of people unemployed, depending upon the economy in that particular quarter of the year or the region of the country, can vary significantly. They require analysis of long-term trends as a guide to the future but, more importantly, the actuaries working with the economists and accountants, and taking into account the practical experience of business and governments in the past, must combine to ascertain the costs of these plans virtually on a year-by-year basis.

In Canada, there is a very complex arrangement with regard to health insurance between the provinces and the Federal Government. Suffice it to say, Canada is very heavily insured with regard to health insurance and, if the province of Ontario is any indication, it is running on to very rocky ground. This is what I would describe as a short-range program with costs becoming somewhat out of hand and unrelated to the benefits being derived by the public. I believe actuaries can offer some advice in this area, but are not best suited to projecting the costs.

One of the prime examples of what has been described as short-range social insurance plans is the hospital-medicare plan in Canada. This is a cost-sharing scheme in which Ottawa laid down certain criteria and stated they would share up to 50% of the cost with the provinces. The plan was introduced in two stages - the hospital plan in 1957 and the medicare plan in 1968.

In the Province of Ontario, Ottawa pays, on a national average basis, 43% of the costs. The province's share is made up of monthly premiums from individuals in the province and, in 70% of the cases, this is paid for by the employers. The province subsidizes people on social assistance, and no contributions are required for pensioners. The premiums collected in this way cover one half of the provincial cost, the balance coming from general provincial taxation.

The Federal Government participation has had a predictable effect on health care costs in that the public scheme required a significant expansion of facilities which, when combined with the recent inflation rates, has caused a tremendous increase in health care costs. The provinces felt this increased cost was predictable because of their experience in the area of post-secondary education in the late 1940's and early 1950's. This had nothing to do with actuarial expertise.

Recently, the Federal Government has attempted to limit the rate of increase in its costs for the hospital-medicare plan. The provinces have resisted. On the other hand, the Federal Government has been forced to accept recommendations from the provinces encouraging lower cost health delivery in such areas as old-age homes, etc.

MR. YOUNG: A major problem in short-term estimating is to communicate the distinction between fluctuations from a trend and changes in the trend.

MR. COWEN: The economic analysis of the cost estimates of social insurance programs becomes considerably more complicated than the pure actuarial elements discussed up to here. There are really two items to this part of the discussion: the economic effects of the social insurance program on the nation, and the economic effects on the individuals receiving benefits and paying taxes. These can be in conflict. The resolution of this conflict can become extremely complex and political.

An actuary who is involved in testimony concerning the effects of proposed legislation must retain his objectivity. If he loses his objectivity, he is subject to attack from one side or the other, and his entire testimony could be impeached. This would be the worst thing that could happen since an actuary as a technician is the individual who must bring balance to the testimony.

It is incumbent upon the actuary to make certain that all aspects of the proposed legislation are made known to the Congressional committees considering the bill. In the railroad industry, the actuary must also make certain that both the labor and management sides are aware of what is involved. The actuary should not take a stand on one side or the other. If he does take a stand, he will become aligned with one side, and his views will not be accepted by the other side no matter how valid they are. If this

happens, the actuary's views could be attacked and this could impede the necessary progress. By the above, I do not mean to imply that the actuary should stay aloof. He must write thorough and objective analyses in such a way as to be nonpartisan. Thoroughness is really the key.

From the point of view of the individual, the most important aspects of proposed legislation in long-term plans concern the replacement ratio at retirement and how benefits will be adjusted after retirement. These permit the individual to plan the economics of his retirement years. They are as much in the realm of the sociologists as they are in that of the economists. Of course, another element for the individual is the insurance protection for his survivors and for his medical expenses, which can be substantial in the retirement years.

From the point of view of the nation and the policy makers, it is also important to know what effects social insurance taxes and benefit payments will have on the economy. Taxes draw money from the economy which would otherwise be available for the purchase of consumer goods and services or for business expansion. This affects the gross national product and the economics of industry. On the other hand, high benefits put money back into the economy. The taxes are paid by one group of the population, while benefits are paid to a different group. Expenditures by beneficiaries will be on different kinds of goods and services than those by the taxpayers. Thus, the administration must consider the overall effects on the economy in making proposals to change the system.

In this day and age, because of the extent to which social insurance affects all of our lives, we must anticipate considerable change over the years. The actuary and the economist have to be objective and put balance into the discussions of proposed legislation, but they cannot lose track of the intended goals.

Up to here, I have been talking in terms of long-range programs. However, there are also unemployment and short-term sickness programs, public assistance, and health insurance programs. Cost estimates for these programs are basically in the realm of the economists. The short-term programs, moreover, are even more affected by economic conditions than are long-term programs. For instance, in periods of high unemployment the duration of benefits is extended an additional 13 weeks for the state unemployment insurance programs under a federal law enacted in 1970. In the railroad industry, unemployment and short-term sickness benefits are 60% of the employee's last daily rate of compensation in the calendar year used as the basis for the benefit, up to a maximum of $24 a day at the present time. The $24 figure happens to be 60% of the average current daily rate of compensation in the industry.

Thus, it can be seen that, even in unemployment benefits, the replacement ratio philosophy is applicable. Changes in the maximum daily benefit rate have occurred in the past and will occur in the future as wages increase. Thus, the economist in a social insurance program involving these types of benefits must be aware of what is happening to wages and the cost of living in general. This really is a form of economic analysis and must be used as a basis for the estimates.

MR. YOUNG: There are two main types of economic analyses: effects on behavior and effects on welfare. These will be considered for each of three aspects of OASDI: benefits, taxes, and the national finances.

Some of the concepts involved will be identified, without trying to give conclusions. There is a lack of consensus among economists, and those who use their work. Also, the basic assumptions as to the cause and effect relationships involved are often quite fuzzy.

The fundamental welfare issue with respect to benefits is to decide on the purchasing power that is to be provided to retirees as a group. Presumably, there is a social consensus that, somehow, retirees will be provided with a reasonable share of national output. How much should that be? A subsidiary issue is the distribution of purchasing power among the retirees. The bottom-weighted benefit formula of OASDI reflects an economic axiom that an additional dollar of income has less utility (i.e., importance) to a higher than to a lower income recipient. Another issue is whether there should be post-retirement increases, and, if so, whether they should protect against inflation, or permit some change in the standard of living. (Note that actuaries are concerned with the financial implications of all these questions. Economists ask more about whether they make the entire society better.)

A behavioral question is how the availability of income not dependent on current work affects incentives. Presumably, the reduced need to earn income reduces the willingness to work; or, alternatively expressed, increases the wage needed to induce the retiree to work. However, that may not be true for that amount by which the retiree's income falls short of needs. Another aspect is that the earnings test implies lower net wages per hour of earned income, up to a point, and thus may discourage work. Is that good or bad? Another behavioral issue is whether automatic adjustments for inflation protection have any effect on the "determination" to control inflation.

A major welfare issue, with respect to taxes, is the effect of FICA on those who pay. An underlying problem is whether to view it as a tax (and hence judge it in terms of ability to pay) or as a purchase of a future claim (and hence judge it in relation to the value of future benefits).

In the behavioral area, there is again the matter of employment. This is related to the economic question of cost shifting: do employees get higher wages to make up for the reduction in take-home pay, due to FICA? Or do employers pay lower wages to make up for the FICA they are required to pay? If wages are higher, do employees work more (because they get more per hour) or do they work less (because they can meet their needs with fewer hours work)? If wages are lower, the questions apply in reverse. Similarly, what is the effect on employer decisions regarding the mix of capital and labor?

What is the welfare effect with respect to national finances of any change in demand for national output? The latter occurs because retirees presumably spend a greater proportion of their income on consumption items; hence, transfers from younger to older people increase consumption demand. Also, the net amount of the transfer, as measured by the change in the Trust Fund, is important.

To what extent is national savings behavior affected by OASDI? Is there a substitution for other savings, and, if so, is the amount displaced determined by FICA or by the value of future benefits? On the other hand, does the assurance of some retirement income provide a "threshold" that encourages savings for additional income to supplement that?

What investment use should be made of the Trust Fund: general government activity, or something that explicitly establishes a claim on future income (such as a toll road)?

It should be kept in mind that economists recognize a difference between any long-range effect that may theoretically occur, and the short-term transition effects (which may take 10, 20, or more years). Often that distinction is not explicitly noted. Also, unfortunately, changes occur so often that the short-term effects constantly obscure any long-term effects that may be occurring.

In summary, economists raise many interesting questions, and there is much to be learned about how to answer them. Asking the right questions is important, even if we do not yet know how to get the answers.

MR. BIRKENSHAW: As any actuary can offer expert opinion on economic problems, I will not pretend to be the exception, although I do profess to having very little background in the field of economics. There are two or three points I would like to make regarding the economics of social insurance plans as I see them in Canada.

First, any statistics I have seen regarding transfer payments from one group in the socio-economic scale to another are more illusory than real. Even in the case of the Canada Pension Plan providing funds to the provinces, those well-off provinces with 74% of the contributors receive 80% of the total funds available. Also, we have seen, time and time again, that the gap between those earning high wages and those earning low wages is not narrowing through the medium of social insurance.

Secondly, with regard to such subjects as unemployment insurance, there is a significant difference between the economic benefits derived by the individual as opposed to the benefits derived by the country. In most cases, the unemployed individual is receiving benefits essential to his well-being and survival. Thus the scheme can be regarded as being worthwhile and beneficial. On the other hand, a scheme which some felt was too liberal at the outset, and perhaps still is,possibly contributed to the high unemployment insurance rate in the country as a result of promoting malingering. Evidence of this kind is difficult, if not impossible, to find, and thus I think it is virtually impossible to assess the economic impact.

Finally, I would like to comment on the gathering of large amounts of capital funds through pension and social insurance schemes in the hands of governments. Certainly, in the case of the Canadian scheme, it has not been proven that these large blocks of money will ever be put back in the hands of the wage earners. It would appear more and more likely that these funds would be considered merely part of the tax base of the provinces and used for normal capital expenditures. On the one hand, this keeps the borrowing of the provinces in the marketplace to a minimum, and provides a

steady inflow of capital funds. On the other hand, there is certainly some feeling that these funds in the hands of the provinces fan the flames of inflation because the provinces have this money ready and available for spending. As a result, I personally cannot accept the idea that the large funds under the Canada Pension Plan and other plans provide for a faster turnover of monies through the pensions paid to retired citizens.

MR. COWEN: There is no question that the final decision concerning long-range cost estimates must be the responsibility of the actuary. He is the individual who can evaluate the effects of various assumptions and, therefore, is in a position to evaluate their propriety.

The economist, however, does have a role in the short-range estimates. Reports to Congressional committees and to the Office of Management and Budget on proposals to amend the social insurance programs always include sections on the short-range effects as well as the long-range effects. In most instances, estimates of the short-range effects are made by economists, while those for the long-range are made by actuaries. I see nothing wrong with this approach. The economist can make these short-range estimates using statistical procedures and for all practical purposes these are sufficient. The long-range estimates, however, require actuarial techniques.

Since both the economist and the actuary are involved in the making of the reports, they must cooperate. It is necessary that there be consistency between the short-range and long-range estimates. Furthermore, the basic statistics used by the actuary in making his experience studies come from the same source and use the same basic data used by the economists for their analyses.

Since the actuary and the economist use the same sources for data, they also must cooperate in making sure that required statistics are maintained to permit their studies.

At the Railroad Retirement Board, historically the economists have played a role in determining the assumptions concerning the levels of future employment for the long-range actuarial cost estimates. However, even here, the final decisions have been made after discussion between individuals of both professions.

A willingness to exchange ideas regardless of the profession of the people involved can only do good. Open discussion is necessary if all elements are to be considered properly. In the United States, the social insurance programs are all so complex that it is extremely difficult for any one individual to be sure that he is considering all of the important elements which are involved in evaluating the future of the programs.

MR. MYERS: I am sorry to say that I cannot agree with Mr. Cowen on the role of economists in making short-range estimates. I strongly believe that this is entirely within the responsibility of the actuaries. True, on certain elements, the actuaries should consult with the economists, but the final responsibility rests with the actuaries. The fact that, in some instances, the economists have had this responsibility is not relevant; actuaries can, on the whole, by their training, experience, and abilities, do a better job, and they should have the responsibility.

MR. R. DENNIS CORRIGAN: Mr. Young has contrasted actuarial conceptions of interest with the theory of interest advocated by economists. The implication that economists adhere to a monolithic interest theory is a great oversimplification. Besides the liquidity-preference theory he has described, we might consider the (clearly mistaken) view held by Aristotle, his medieval successors, the churchmen, and in modern times Marxian theorists, that interest is at all times and in any amount usury. Or, take the view of the Austrian school of economics, which holds that interest is simply the ratio in the mutual valuation (i.e. of both lender and borrower) of present goods as against future goods. Do all three of these theories of interest stand in sharp distinction to the actuarial view of interest?

Mr. Young has also stated that contributions to Social Security can be thought of as either premiums or taxes. This is not the view of the Supreme Court, which decided in the Nestor case (Flemming v. Nestor, 363 U.S. 603 (1960)) that the contribution exacted under the program is a tax.

Finally, with reference to the Brittain proposals (to finance OASDI out of general revenues), I should like to remind the meeting of the foresight of Mr. Ray M. Peterson, who in his paper "Misconceptions and Missing Perceptions of Our Social Security System (Actuarial Anesthesia)" in T.S.A. XI (page 831) pointed out:

> If the image (of social security) projected is the more accurate one of substantial socialization of contributions and not one which parallels the payment of premiums for conventional insurance benefits, a clamor of unfairness may arise over taxing of the initial bracket of gross income -- a regressive income tax. The author wonders whether there has been sufficient appreciation of the likelihood of the development of this dilemma. Are we deceiving ourselves as to the successful continuance of the self-supporting principle, or will direct governmental support become necessary? Has the actuarial anesthetic been too powerful?

MR. YOUNG: I agree that economists do not have a monolithic view of interest. My point was that they analyze it as a behavioral incentive, while actuaries concentrate on its financial role as a time adjustment.

The question of tax regressivity and the Supreme Court decision on the relation of benefits to taxes are related. As I noted, the manner of posing the question influences the answer.