

**A CRITICAL ANALYSIS OF THE ASSUMPTIONS IN THE
1980 SOCIAL SECURITY TRUSTEES' REPORTS**

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ABSTRACT

This paper presents a critical analysis of the economic assumptions employed in making projections of the social security program. It discusses the importance of the relationship between increases in the Consumer Price Index and increases in wages in covered employment. It develops historical trends in this relationship, compares these trends with projections made by the Social Security Administration, and demonstrates the adverse impact on the projections of the failure to recognize these historical trends.

I. NATURE OF THE SOCIAL SECURITY PROGRAM

THE social security program, which encompasses the old-age and survivors insurance (OASI), disability insurance (DI), hospital insurance (HI), and supplementary medical insurance (SMI) programs, is the largest social insurance system in the world. In 1979, nearly \$134 billion in benefits was paid under these programs, and thirty-five million beneficiaries were on the rolls at the end of the year.

The social security program is a relatively mature social insurance system, and each of the programs it encompasses has unique benefit and financing characteristics that make it unlike any private insurance or pension plan. For OASI and DI, there is a direct statutory link between benefit increases for present beneficiaries and increases in the Consumer Price Index (CPI). Also, for OASI, DI, and HI, there is a direct link between increases in covered wages and program income. Each program is financed on a current-cost or pay-as-you-go basis, with each program's trust fund serving only as a contingency reserve. In recent years the level of the contingency reserve has declined far below 100 percent of the projected outlays for the following year, the level recommended by the 1971 Advisory Council on Social Security and endorsed by the trustees of the social security trust funds as a financing goal. Because of all these characteristics, the experience of the social security program is extremely sensitive to economic conditions. Furthermore, this experience emerges rapidly, unlike the gradually emerging

experience of an immature private insurance or pension plan. This fact, and the volatility of the United States economy, suggest that the assumptions used in projecting the financial results of the program, particularly the short-range assumptions, should be selected with the utmost of care in order not to obscure developing financial problems.

The trustees' reports are the annual reports to the Congress on the financial status of the social security program. The Congress and the executive branch use the reports as a basis for planning the future financing of the social security program. The actuarial staff of the Social Security Administration (SSA) is responsible for preparation of the OASDI report, and the actuarial staff of the Health Care Financing Administration (HCFA) is independently responsible for the preparation of the HI and SMI reports. All the reports are, of course, based on the same sets of economic assumptions. Although the projections in all the trustees' reports are made on the basis of three sets of assumptions (optimistic, intermediate, and pessimistic), the comments in this paper concern primarily the intermediate assumptions.

II. THE ECONOMIC ASSUMPTIONS IN THE 1980 TRUSTEES' REPORTS

The 1980 trustees' reports were approved, signed by the members of the boards of trustees, and transmitted to Congress on June 17, 1980. Selected short-range economic assumptions used in the reports are presented in Table 1. For purposes of comparison and discussion, historical values also are presented. The economic assumptions shown in Table 1 were essentially those recommended by the actuarial staff of SSA. These assumptions were used, without qualification, by the actuarial staff of SSA for making projections. However, the actuarial staff of HCFA qualified its projections by informing the secretary of the board of trustees of the HI and SMI trust funds (the acting administrator of HCFA) that it did not consider the economic assumptions to be adequate or appropriate for projecting the actuarial status of the trust funds. The purpose of this paper is to present the reasons for the authors' belief that the short-range economic assumptions used in the 1980 trustees' reports are unjustifiably optimistic, and that the actuarial staff of HCFA was justified in qualifying its projections.

Specifically, the economic assumptions are overly optimistic with respect to the projected gain in average real covered earnings (defined as the compounded difference between increases in average covered earnings and the CPI) over the next ten to fifteen years. This assumption is critical in determining the actuarial status of the OASI, DI, and HI trust funds, since it determines in large part the relationship between income and outgo of the trust funds. Moreover, the next ten to fifteen years are a critical period for the social security program because, even under these assumptions, the HI

TABLE I

INTERMEDIATE ASSUMPTIONS IN THE 1980 TRUSTEES' REPORTS

Calendar Year	Average Annual CPI Increase	Average Annual Nominal Earnings Increases	Average Annual Real Earnings Increases
	Historical		
1952	2.2%	5.6%	3.2%
1953	0.8	6.5	5.6
1954	0.4	1.7	1.4
1955	-0.3	3.9	4.2
1956	1.4	6.3	4.8
1957	3.5	3.7	0.2
1958	2.8	2.3	-0.4
1959	0.8	5.0	4.2
1960	1.6	3.3	1.7
1961	1.1	1.4	0.3
1962	1.2	4.7	3.5
1963	1.2	2.9	1.6
1964	1.3	4.6	3.3
1965	1.7	2.5	0.8
1966	2.9	5.7	2.7
1967	2.8	5.5	2.6
1968	4.2	6.4	2.1
1969	5.4	6.7	1.3
1970	5.9	4.9	-0.9
1971	4.3	4.9	0.6
1972	3.3	7.3	3.9
1973	6.2	6.9	0.6
1974	11.0	7.5	-3.1
1975	9.1	6.6	-2.3
1976	5.8	8.4	2.4
1977	6.5	7.1	0.6
1978	7.6	8.1	0.5
1979	11.5	8.4	-2.7
	Projected		
1980	14.2%	9.6%	-4.0%
1981	9.7	9.5	-0.1
1982	9.0	10.9	1.7
1983	8.6	9.9	1.2
1984	8.2	9.4	1.1
1985	7.8	9.1	1.2
1986	7.4	8.8	1.3
1987	7.1	8.8	1.6
1988	6.9	8.6	1.6
1989	6.7	8.4	1.6
1990	6.5	8.3	1.7

trust fund is projected to be exhausted by 1994, and the OASI trust fund is now expected to be able to continue to pay benefits during that period only by borrowing from the DI and HI trust funds.

Table 2 presents accumulated gains in average real earnings over periods of one year, five years, ten years, and fifteen years, for both historical and projected periods. Real earnings gains are accumulated over successively longer periods of time in order to smooth out fluctuations in the business cycle that tend to obscure the underlying trends. Figure 1 illustrates graphically the trend in ten-year real earnings gains presented in Table 2. Note that the projected accumulated experience in Table 2 and Figure 1 is heavily affected by historical experience. Thus, although it may appear that continued adverse experience is projected for a number of years in the future, this accumulated adverse experience is almost completely the consequence of the very large negative earnings gain experienced during the 1970s and the experience emerging during 1980. The trustees' report assumptions result in accumulated gains in average real covered earnings of 13.7 percent over the ten-year period 1981-90. As indicated in Table 2 and Figure 1, such large gains in real earnings represent a sudden and dramatic reversal of both

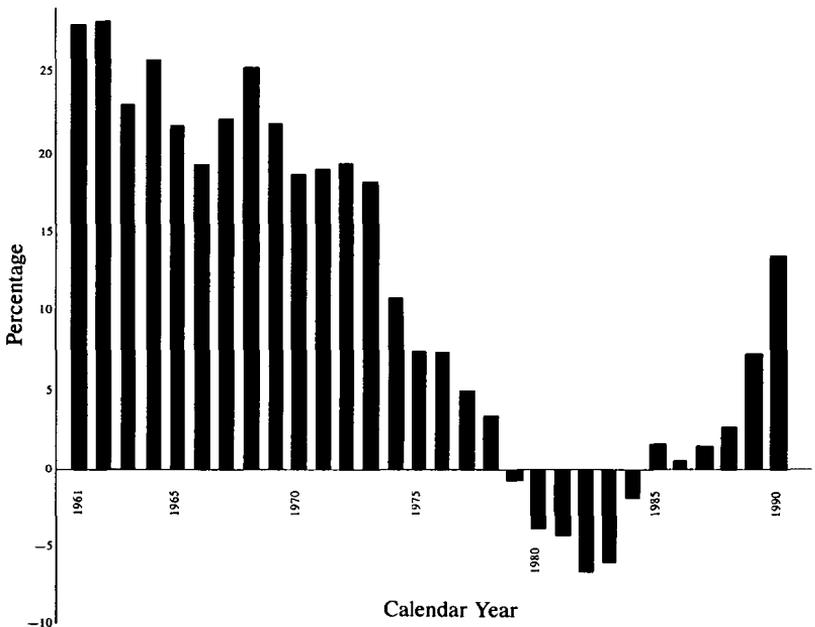


FIG. 1.—Accumulated gain in real earnings over the ten-year period ending with the calendar year indicated.

TABLE 2

ACCUMULATED GAIN IN REAL EARNINGS DURING PERIOD OF YEARS INDICATED
BELOW, ENDING WITH CALENDAR YEAR SHOWN AT LEFT

Calendar Year	1 Year	5 Years	10 Years	15 Years
Historical				
1952	3.25%			
1953	5.65			
1954	1.37			
1955	4.17			
1956	4.77	20.7%		
1957	0.21	17.1		
1958	-0.45	10.4		
1959	4.20	13.4		
1960	1.68	10.7		
1961	0.34	6.0	28.0%	
1962	3.51	9.5	28.3	
1963	1.63	11.8	23.4	
1964	3.27	10.8	25.7	
1965	0.83	9.9	21.7	
1966	2.70	12.5	19.3	44.0%
1967	2.60	11.5	22.2	43.1
1968	2.08	12.0	25.3	38.2
1969	1.30	9.9	21.8	38.2
1970	-0.93	7.9	18.6	31.5
1971	0.60	5.7	19.0	26.1
1972	3.89	7.0	19.4	30.9
1973	0.62	5.5	18.2	32.2
1974	-3.10	1.0	10.9	23.0
1975	-2.29	- 0.4	7.5	18.2
1976	2.44	1.4	7.2	20.7
1977	0.58	- 1.8	5.1	17.1
1978	0.47	- 2.0	3.4	15.9
1979	-2.72	- 1.5	- 0.7	9.1
Projected				
1980	-4.0 %	- 3.3%	- 3.7%	3.9%
1981	-0.1	- 5.6	- 4.4	1.1
1982	1.7	- 4.7	- 6.4	0.2
1983	1.2	- 4.0	- 5.9	- 0.7
1984	1.1	- 0.2	- 1.8	- 0.9
1985	1.2	5.2	1.7	1.3
1986	1.3	6.7	0.6	2.0
1987	1.6	6.6	1.6	- 0.3
1988	1.6	7.0	2.7	0.7
1989	1.6	7.5	7.3	5.6
1990	1.7	8.1	13.7	9.9

long-term and short-term trends in real average earnings. Since the mid-1950s, gains in real average earnings have been declining; during the ten-year period 1970-79, real earnings actually decreased by 0.7 percent, and the trend appears to be accelerating rather than reversing. Even during the very short-term future, which should be heavily influenced by recent experience, the projected experience is significantly better than recent experience. For example, during the five-year period ending with 1979, cumulative real earnings decreased by 1.5 percent, but cumulative real earnings for the five-year period ending in 1985 are projected to increase by 5.2 percent.

Table 2 shows that annual gains in real average earnings are projected to increase to 1.7 percent by 1982 and to remain above 1 percent for the duration of the projection period. However, the historical data in Table 2 indicate that only twice during the 1970s (in 1972 and 1976) were increases in real average covered earnings above 1 percent. Table 1 shows that in every year during the period 1981-89, average nominal covered wages are projected to increase at a rate as high or higher than that of any recent year in the United States economy (the previous high was an 8.4 percent increase in 1979). The greatest single projected CPI increase during that same period is 9.7 percent in 1981, which is considerably less than the 11.5 percent increase recorded in 1979, the 11.0 percent increase recorded in 1974, and the results emerging in 1980. Thus, we see that economic conditions during the 1980s are projected to be significantly better than during the 1970s.

In their recommendations to the trustees, the actuarial staff of SSA offered the following explanation for the long-range or ultimate real wage increase assumptions:

The factors that we expect to result in improvement in real wage gains include (1) the deceleration or even decline in spending in the environmental and safety areas, (2) the maturation of the labor force (i.e., a declining proportion of the labor force made up of less experienced women and youth), (3) the redesign of technology for more efficient use of energy, (4) the deceleration of price increases for energy when imported oil comes within the price range of domestically produced substitutes, and (5) an increase in capital investment as inflationary pressures ease.

Although no explanation was given specifically for the short-range assumptions, it should be noted that real wage gains are projected to reach the approximate level of the ultimate assumption of 1.68 percent by 1987. Indeed, the *average* annual real wage gain during the ten-year period 1982-91 is 1.5 percent, which is very near the ultimate assumption. Therefore, the factors mentioned above as contributing to improvements in real wage gains apparently are assumed to take effect during the next five to ten years.

The factors mentioned above are long-term in nature and cannot be expected to have the dramatic impact on real wage growth that has been projected during the next ten to fifteen years. Taken together, they hypothesize the imminent approach of a period of economic prosperity characterized by (1) extremely favorable developments in the area of energy cost and availability, (2) surges in the type of capital spending that results in increases in productivity, and (3) declines in the type of regulatory activities that impede productivity. As appealing as this scenario might be, it is not a prudent basis for formulating actuarial assumptions underlying the projections for programs having the characteristics of the social security program.

Regarding the effect of factor 2, the maturation of the labor force, recent demographic analyses by SSA have demonstrated that the large numbers of young and female workers who entered the work force during the 1960s and 1970s had a depressing effect on average nominal wage increases. These same analyses indicated, however, that this negative demographic effect reached its peak in the 1960s, although the decline in real earnings accelerated in the 1970s. Thus, demographic effects appear to have had a very limited impact on real earnings gains in the past. In any case, it would seem imprudent, without further study, to project real earnings gains in the near future based on these analyses. The following arguments, which apparently were not considered by SSA, suggest reasons for the historical decline in real earnings growth, and form the basis for the authors' belief that there will not be, in the near future, a dramatic upturn in recent trends in real earnings.

1. The rate of increase in the CPI, which directly determines social security benefit increases, overstates the underlying inflation rate because of widely recognized technical flaws in the method of calculating the index. The CPI gives limited or belated recognition to shifts in the weights of the various items in the CPI market basket. Such shifts may be caused by reduced consumption of items whose prices have increased rapidly or whose quality or durability has been greatly improved, or by the addition of new items to the market basket. Rapid technological advances, which cause such shifts, tend to exaggerate the effects of this flaw. The rapid technological advances that overstated CPI increases in the 1970s most likely will continue into the 1980s and even accelerate, thus widening the gap between the CPI and the basic inflation rate.
2. Future social security tax increases already scheduled in the law for 1981, 1982, 1986, and 1990, and continued special tax treatment for fringe benefits, will encourage employers to continue to offer a large proportion of total compensation increases in the form of fringe benefits not subject to social security taxes. Thus, earnings covered by social security will continue to increase at a rate lower than that for general compensation increases.

3. The two preceding arguments explain how, as indicated in Figure 1, the relationship between *covered wage* increases and *CPI* increases (which affects the health of the social security trust funds) may be worsening rapidly, while the fundamental relationship between increases in *compensation* and *inflation* (which determines the health of the economy) may be nearly stable. The continuation of the trend observed in Figure 1 does not necessarily imply a similar trend in the general economy. Thus, it generally would not require a highly unfavorable economic environment for gains in real covered earnings to continue to be small or negative for many years to come.
4. Foreign manufacturers will continue to compete successfully with United States manufacturers for some time to come (as they have recently in the areas of steel, automobiles, and electronics equipment); this will result in reduced wage and economic growth in the United States.
5. Continued increases in the cost of energy will drive prices up. Continued dependence on foreign energy sources, resulting in volatile energy supplies and recurring shortages, will contribute to economic uncertainty and act as a constraint on economic growth.
6. A continuation of the trend toward a more service-oriented economy will make future productivity gains, which contribute to real wage gains, more difficult to achieve.

III. RESULTS AND CONSEQUENCES

Prior to the enactment of the 1972 social security amendments, which provided for automatic adjustments to the taxable-earnings and benefits base and for automatic increases in benefits based on the CPI, social security projections were based on so-called level benefit, level earnings assumptions. Any actuarial gains that were realized as a result of these conservative assumptions became available for future ad hoc increases in social security benefits. Beginning in 1973, the estimates presented in the trustees' reports were computed using dynamic economic assumptions with regard to benefit increases and increases in taxable earnings. Since then, the assumptions used in the trustees' reports have been biased consistently in the direction of overoptimism with regard to projected real earnings growth. For example, the projections in the 1974 trustees' reports of real earnings growth for the five-year period 1975-79 exceeded the actual rate of real earnings growth by nearly 16 percent, or over 3 percent per year. Similar comparisons of assumptions in more recent trustees' reports with actual experience reveal average annual errors of about 3 percent or more. The 1978 trustees reports overprojected real earnings growth in 1979 by more than 4 percent. Even the pessimistic assumptions contained in the trustees' reports have not given sufficient consideration to the instability of the United States economy; thus, the actual experience of the social security program has been consistently worse than even the pessimistic assumptions would indicate.

The 1977 social security amendments were widely heralded at the time of enactment as having ensured the financial integrity of the OASDI program for the next fifty years. Even as recently as 1979, the conclusion of the OASDI report stated that "if the economic conditions projected under the intermediate or optimistic assumptions occur, the fund is adequately financed for at least well into the next century." The 1980 OASDI trustees' report, however, concludes that "over the short term, the OASI trust fund will face financial strains requiring policy actions. Without such actions, the OASI fund would be depleted in late 1981 or early 1982, depending on the course of the economy."

In a published summary of the 1980 trustees' reports, the actuarial staff of SSA gave the following explanation for the changes in the OASI projections:

Based on projections made when the 1977 Amendments to the Social Security Act were adopted, it was widely believed that the financial health of the social security programs had been restored for a period well beyond the turn of the century for the OASDI program and into the last decade of this century for the HI program. Since 1977, however, the economy has behaved in ways that few anticipated at that time. Inflation by itself normally does not affect the trust funds, because in most years tax revenues rise more rapidly than benefit outgo. But in recent years, OASI tax revenues have not kept up with automatic increases in benefits. As a result, the OASI trust fund is doing less well than was expected, and additional income will be needed for OASI within about one and one-half years.

Table 3 presents a comparison of the projected income and outlays of the OASI, DI, and HI trust funds made in conjunction with the 1977 social security amendments, with the projected income and outlays underlying the 1980 trustees' reports. (The amounts presented in Table 3 differ slightly from those appearing in the 1980 reports, since, for comparison purposes, they do not reflect the impact of Public Law 96-265, which was enacted June 9, 1980.)

As Table 3 indicates, there has been a substantial upward revision in the projected OASI outlays since 1977, averaging over 28 percent during the period 1980-87. This increase has been only partially offset by the upward revision in the projected income during the same period. This change in the relationship between projected income and disbursements explains in large part the rapid deterioration in the projected status of the OASI trust fund since the enactment of the 1977 legislation. The 1977 projections were based on the assumption of a real earnings gain of 7.4 percent during the period 1977-79. Even the pessimistic assumptions projected a real earnings gain during that same period of 4.9 percent, while the actual result was -1.6 percent. Although some might argue that these results were caused by a

TABLE 3
COMPARISON OF CURRENT* ESTIMATES OF INCOME AND DISBURSEMENTS OF OASI, DI, AND HI TRUST FUNDS WITH
ESTIMATES MADE AFTER ENACTMENT OF P.L. 95-216 (1977 SOCIAL SECURITY AMENDMENTS),
FOR CALENDAR YEARS 1980-87†
(Dollar Amounts in Billions)

CALENDAR YEAR	OASI			DI			HI		
	1977	Current	Percent Change	1977	Current	Percent Change	1977	Current	Percent Change
	Disbursements								
1980	\$100.0	\$108.6	8.6%	\$17.1	\$15.9	- 7.0%	\$25.7	\$24.8	- 3.5%
1981	108.4	126.9	17.1	19.0	17.9	- 5.8	29.7	28.4	- 4.4
1982	117.4	144.4	23.0	20.9	19.8	- 5.3	33.9	33.0	- 2.7
1983	126.3	161.8	28.1	22.9	21.6	- 5.7	38.5	38.3	- 0.1
1984	136.0	180.3	32.6	25.2	23.8	- 5.6	43.7	44.6	2.1
1985	146.4	199.8	36.5	27.7	26.1	- 5.8	49.1	52.0	5.9
1986	157.3	219.9	39.8	30.3	28.5	- 5.9	54.9	60.3	9.8
1987	168.9	240.9	42.6	33.1	31.2	- 5.7	61.2	69.9	14.2
Average percent change, 1980- 87			28.5%			- 5.8%			2.7%

NOTE.—Similar comparisons of SMI disbursement projections are not available, since, in 1977, SMI projections were made only through 1979.

*Estimates underlying the 1980 trustees' reports. For comparison purposes, amounts do not reflect the impact of Public Law 96-265, enacted June 9, 1980.

†From *Actuarial Cost Estimates for the Old-Age, Survivors, Disability, Hospital, and Supplementary Medical Insurance Systems, as Modified by Public Law 95-216* (Washington, D.C.: Government Printing Office, March 3, 1978).

TABLE 3—Continued

CALENDAR YEAR	OASI			DI			HI		
	1977	Current	Percent Change	1977	Current	Percent Change	1977	Current	Percent Change
	Income								
1980	\$101.5	\$102.8	1.3%	\$17.6	\$18.1	2.8%	\$25.7	\$26.4	2.7%
1981	116.0	115.8	- 0.2	21.1	21.8	3.3	34.0	35.0	2.9
1982	127.2	131.5	3.4	23.0	25.2	9.6	37.1	40.5	9.2
1983	136.6	147.2	7.8	24.7	28.8	16.6	39.7	46.0	15.9
1984	146.4	163.8	11.9	26.5	32.8	23.8	42.3	51.8	22.5
1985	162.0	188.3	16.2	32.1	42.0	30.8	46.3	59.7	28.9
1986	174.1	208.4	19.7	34.9	47.9	37.2	52.4	70.6	34.7
1987	186.3	228.9	22.9	37.4	54.0	44.4	55.8	78.3	40.3
Average percent change, 1980- 87 .....	.....	.....	10.4%	.....	.....	21.1%	.....	.....	19.6%

change in the economy that could not have been predicted in 1977, the analysis of real wage gains discussed earlier in this paper shows that results very similar to the actual results could have been foreseen in 1977. It was the failure of the economy to change, not a change in the economy, that necessitated the substantial revisions in the OASI projections.

IV. CONCLUSION

Real earnings gains, as defined above, have been declining since the mid-1950s, and the rate of decline has accelerated during the last decade. The failure to recognize this trend when formulating the short-range actuarial assumptions for past trustees' reports has resulted in unjustifiably optimistic projections for the social security program, which have, in turn, resulted in the underfinancing of the program and the obscuring of the true cost of the program. The 1980 trustees' reports also have failed to give recognition to this trend, projecting a dramatic upturn in real earnings gains during the 1980s. There is insufficient evidence for projecting such a dramatic upturn in real earnings gains, particularly in view of the critical impact of this assumption on the social security program. Hence, on the basis of the foregoing analysis, the short-range economic assumptions underlying the 1980 trustees' reports cannot be considered reasonably indicative of future experience.

DISCUSSION OF PRECEDING PAPER

GREGORY J. SAVORD:

Messrs. King and Powell have thoroughly discussed the critical issues relating to the assumptions used to evaluate the financial condition of the social security trust funds. Although the authors limited their discussion to the short-range real earnings gain assumptions (the assumptions used for projections covering the next ten to fifteen years), the long-range assumptions (up to seventy-five years) are also of critical importance.

The long-term financial status of the social security system is extremely sensitive to the real earnings gain assumption because the relationship between social security taxable payroll and social security benefits is largely determined by the growth in real wages. The 1980 trustees' reports assumed that average wages ultimately would grow at a rate 1.75 percent faster than the CPI increase each year. For several reasons, I feel that this assumption is too optimistic and, consequently, that the long-term financial problems of the social security system are understated.

First, the economy experienced an average annual increase, for the years 1951-80, of 1.3 percent in real wages. (Reliable, comparable data before 1951 are not available.) The ultimate assumption implies not only that we will experience a dramatic economic recovery that will return to the prior level of economic performance, but also that the economy will perform for a sustained period at a level higher than that experienced in the last thirty years.

Second, most of the growth in real wages occurred in the 1950s, a postwar expansion era stimulated by a virtually limitless supply of cheap energy. The economy of the future may be constrained by finite resources and labor may be substituted for these resources, making growth in real wages difficult, if at all possible.

Third, increases in worker productivity are the primary source of real wage growth. (Wages can also be increased by working more hours, but the trend in hours worked is downward.) One consideration is that many of the past increases in productivity were in the agricultural sector. Now that agricultural work is a small part of the national payroll, even further large increases in agricultural productivity will have only a small impact on overall productivity increases. Another consideration is that attempts to increase productivity are resisted by labor. Labor views such measures, for example,

automation, as a direct threat to jobs. Such an attitude does not encourage rapid increases in productivity.

Fourth, workers are increasingly taking compensation increases in the form of fringe benefits rather than higher wages. While it is often argued that this trend cannot continue much longer, one of the forces driving it, income tax policy, is growing. Fringe benefits receive favorable tax treatment, while wages are subject to high marginal tax rates. Since the trustees' reports assume no future changes in the law, regulation, and policy, the average tax rates will increase as incomes increase and creep into higher marginal tax rate brackets. Fringe benefits will look increasingly attractive in the future, thus dampening wage increases. Further, high tax rates will discourage savings and investment, thus hindering capital improvements and productivity increases.

An important issue in preparing the trustees' reports is the time when the ultimate assumptions will take effect. The ultimate real wage assumption in the 1980 trustees' reports started in the year 2005, twenty-five years into the future. To compound matters, the years 1990–2004 had an even higher assumption, 1.8 percent. Since it is appealing to grade the short-range assumptions smoothly into the long-range assumptions, the assumptions of the late 1980s had to be unreasonably optimistic in order to reach the 1990 level, further clouding the financial picture. The ultimate long-range assumptions should not color the short-range assumptions.

It is likely that the ultimate real wage assumption for the 1981 trustees' reports will be reduced to 1.5 percent. This is a step in the more realistic direction. Further, it is highly probable (if the SSA actuaries believe their short-range projections) that the assumption may have to be reduced to 1.25 percent after a few more reports. If it appears that the real wage assumption needs changing in the future, why not change it now? I feel that an annual ultimate real wage assumption of 1.25 percent is much more realistic and is not inconsistent with the experience of the last thirty years. An annual growth of 1.25 percent in real wages over a period of fifty years will increase the purchasing power of workers by 86 percent, certainly not an overly pessimistic outlook.

I commend Messrs. King and Powell on their fine paper and hope it leads to a more realistic appraisal of the trustees' reports' assumptions. We do not need social security financing crises every few years.

ROBERT J. MYERS:

Messrs. King and Powell have vividly brought to the attention of the actuarial profession probably the most difficult problem faced by actuaries in the social security field—namely, the development of reasonable and

appropriate economic assumptions to be used in the cost estimates, both short range and long range. Such economic assumptions are now necessary because of the various automatic-adjustment features of the OASDI and HI programs. This is in contrast to the situation before 1972, when the benefit structure was geared to the economic situation prevailing at the time—and so the use of dynamic projected economic assumptions was not appropriate.

The authors focus their attention entirely on the OASI, DI, and HI trust funds, and mention only in passing the fourth social security trust fund, SMI. It is of interest—although it is not often recognized—that the SMI trust fund is “actuarially sound” by even the strictest definition of this term, unlike the other three trust funds, which are financed on a more or less current-cost basis.

The 1980 SMI trustees’ report shows that, as of June 30, 1979, this trust fund had an excess of assets over liabilities of \$2.3 billion. Expressed in another manner, assets equaled 122 percent of liabilities. This means that, if the program had been terminated on that date, all benefits for medical expenses incurred up until then could have been paid, and a surplus of over \$2 billion would have remained. It should be noted, however, that the estimated surplus situation for the next two years was not as favorable, although still positive (namely, for mid-1981, a surplus of \$1.2 billion, or 8 percent relatively).

It is also interesting to note that the SMI trust fund had been near bankruptcy at one time, even when considered only from a cash-flow standpoint. In mid-1970 it had a fund balance of only \$57 million, or about one month’s outgo. However, a substantial increase in the premium rate that went into effect at that time “saved” the situation.

It need hardly be said that making forecasts of the economic situation is extremely difficult—and, if they are expected to be quite accurate, even impossible. The general procedure in developing the economic assumptions for the cost estimates contained in the trustees’ reports is that the actuaries in the Social Security Administration first undertake this task. The preliminary results are then reviewed by economists and policymakers from the staffs of the three trustees. The SSA actuaries then consider the various comments and suggestions made, and alter the assumptions as seems appropriate. Quite properly, the assumptions for the very short-range future are developed to as great an extent as possible, and as seems reasonable, to be consistent with the economic forecasts underlying the general governmental budget procedures. To date, the SSA actuarial staff has always believed that the economic assumptions used—as modified by suggestions and comments from others—have been reasonable and appropriate for use, within the context of the Guides to Professional Conduct.

The authors criticize adversely the economic assumptions used in the 1980 trustees' reports on the grounds that they are far too optimistic, both in the near future and over the long term. In essence, their criticism is based on the long-term decrease in the level of the annual changes in real earnings—as shown vividly by their Figure 1 and Table 2. I believe, however, that projection of economic elements cannot be made solely by mechanistic trend analysis, even though this is backed up by general reasoning as to the underlying causative factors.

Actuaries are highly familiar with the fact that the trend of mortality rates has moved rather smoothly over the years, and thus projection is quite feasible. When it comes to fertility rates, however, a considerably different situation exists. In the 1930s there was some apprehension that fertility was so low that the population would eventually become extinct. Then, in the 1950s, there was the great fear of the so-called population explosion, under which there would be an ever growing populace and developing shortages of resources. In the past decade the pendulum has swung the other way once again, and we are having fertility below the replacement level, which would mean the eventual decline and extinction of our populace (unless immigration would fill the gap).

In the same way, I believe that it is quite possible that economic conditions can have sharp discontinuities. Thus, for reasons not now entirely clear, a trend of real wages very different from that of the 1970s could occur.

The Reagan administration has made projections of the changes in real wages that will occur if its program for economic recovery is enacted. These are shown in Table 1 of this discussion, which also presents the corresponding figures from the three alternative estimates in the 1980 trustees' report. Quite likely, the authors would say that these assumptions from the Reagan budget are too optimistic, because they show higher real-wage gains than do even the optimistic alternative assumptions of the 1980 trustees' report.

TABLE 1

ASSUMPTIONS AS TO CHANGES IN AVERAGE ANNUAL REAL WAGES

YEAR	1980 TRUSTEES' REPORT			REAGAN BUDGET	WORST CASE
	Optimistic	Intermediate	Pessimistic		
1981	+0.9 %	-0.2 %	-2.0 %	-0.6 %	-1.9 %
1982	+2.4	+1.9	+0.9	+1.4	-2.3
1983	+2.0	+1.3	+0.3	+2.4	-1.1
1984	+2.0	+1.2	+0.2	+2.3	+1.0
1985	+2.0	+1.3	+0.5	+2.2	+0.6
1986	+2.2	+1.4	+0.6	+2.7	+0.5
Ultimate	+2.25%	+1.75%	+1.25%	+1.75%	+1.75%

Yet who is to say, in the economic field, what will actually transpire? Certainly in 1977 nobody foresaw the dire economic conditions of 1979-80, despite what the authors see now, with benefit of hindsight and the use of ten-year moving averages. I believe that similar analysis of the fertility experience in the early 1960s would not have predicted the precipitous decline to the levels reached in the 1970s. In the same way, it is quite possible that we will experience the "economic discontinuity" shown by the Reagan budget economic assumptions as to changes in real wages.

This still leaves the actuary in a difficult situation as to what economic assumptions to use. Certainly, one should not select solely optimistic assumptions. Nor, on the other hand, should complete reliance be put on the most pessimistic ones.

In presenting its proposals for changes in the OASDI system in May, 1981, the Reagan administration adopted what I believe to be an excellent approach. The short-range financing underlying the proposal is based on so-called worst-case economic assumptions (as also shown in Table I), although at the same time there are shown the results that would follow if the expected economic conditions occur. The long-range cost analysis is based on intermediate economic assumptions. Accordingly, over the short run, there is a "best of all worlds" situation—if economic conditions turn out to be as anticipated, the balance in the trust funds will rise from the current perilously low levels to more adequate amounts, whereas if economic conditions unexpectedly turn out adversely, sufficient financing will still be present to ensure the payment of benefits.

In conclusion, I believe that the range of economic assumptions used in the 1980 trustees' report was reasonable and proper when it was adopted and that, even today, it continues to be that way. Quite obviously, in hindsight, the short-range assumptions were too optimistic, but this is not to say that, now, we know that what should be assumed in the next few years should be as pessimistic as the 1979-80 experience would project to.

DWIGHT K. BARTLETT III:

I welcome the paper by Messrs. King and Powell as opening up for more general discussion in the profession a subject of great importance that heretofore has been the exclusive domain of those few actuaries who specialize in the area. While analysis based on specialized expertise is important in arriving at conclusions about appropriate economic assumptions for projections of the social security program, professional judgment, which the specialists do not hold exclusively, is also of value. Nevertheless, I believe that, as a focus for this discussion, the paper could have been greatly strengthened in several ways.

1. The authors might have shown the implications of erroneous economic assumptions in a more understandable way. Table 3 is an attempt in this direction, but it fails to detail the resulting trust fund ratios, which better illustrate the risk of erroneous assumptions. The trust fund ratios are defined as the ratios of assets in the trust funds at the beginning of a calendar year to the expected expenditures for the year. For the social security program, which is financed on a current-cost basis with the trust funds serving as a contingency reserve, projections of the trust fund ratios over the next few years are a good measure of the adequacy of the short-term financing.

2. The authors might have stated what the assumptions were for the 1977 projections compared with those for the 1980 trustees' report projections, so that the reader could understand the sensitivity of the program to alternative economic conditions. Later in this discussion I will include some pertinent analysis.

3. The authors criticize the assumptions used in the 1980 trustees' report but fail to state what, in their view, would have been more appropriate assumptions, along with an analysis to support such alternatives.

4. The authors might have acknowledged that the OASDI trustees' report included the statement: "The assumptions and estimates that appear in this report were necessarily prepared before the most recent changes in the economy were known. Current evidence indicates that the economy has moved into a recession and is weakening rapidly. Therefore, revised short range projections will probably be necessary in the near future as more information becomes available about the intensity in the changes of the economy." In fact, revised projections were made shortly after the trustees' report was published. These reflected a significantly more pessimistic view of the economy over the next several years than the earlier assumptions. It is likely, however, that the authors would have found the revised assumptions only slightly less objectionable than the trustees' report assumptions.

5. The authors leave the impression that the short-range problems currently facing the old-age and survivors insurance trust fund are a result of failure to foresee the weakness of the economy in the latter part of the 1970s and on into the 1980s at the time the 1977 amendments to the Social Security Act were adopted. The trustees' reports of recent years have included projections based on three alternative sets of assumptions, which may be characterized as optimistic, intermediate, and pessimistic. The pessimistic assumption projections in the 1978 trustees' report, prepared shortly after the enactment of the 1977 amendments, show that the OASI trust fund stood a good chance of being exhausted by 1985. I believe that the current short-range financing problems of the social security program are a result less of inadequate actuarial analyses at that time than of the decision of Congress in 1977 to build up the trust funds over a fairly long period as opposed to imposing tax increases that would have built up the trust funds to those levels over a shorter period such as five years. While Congress has traditionally decided, when adopting changes in the tax schedule, to have the ultimate rate go into effect at a fairly distant date, that tradition developed in an era when the trust fund ratios were much higher, and hence when there were much larger margins for error. Such conditions obviously did not obtain in 1977, and the actuarial analysis of the time gave strong indication that the tax

increases should not be deferred if possible early reoccurrence of financing problems was to be avoided.

6. In the last analysis, the assumptions used in the projections included in the trustees' report are not those of the actuaries preparing the projections but rather those of the board of trustees, the secretaries of the Treasury, Labor, and Health and Human Services. Obviously, they are greatly influenced by the recommendations of the actuaries and generally accept their recommendations for the demographic assumptions and the long-range economic assumptions. The short-range economic assumptions do present a more difficult political problem for them, since the administration, of which the trustees are members, has staked out a position on the economic prognosis for the economy in developing the federal budget submission each year. It is difficult for the trustees to, in effect, repudiate the budget assumptions when they are reviewing recommendations for assumptions for the trustees' report. The budget assumptions traditionally have been made with the notion that Congress will adopt the administration's legislative program in toto and that the program will have the effect predicted on the economy. Over the years it has been possible to partially divorce the trustees' report assumptions from the budget assumptions by allowing sufficient time to elapse from the time the budget is prepared in January until the trustees' report is prepared four or five months later. That divorce cannot, however, be totally complete.

The political situation of the trustees creates a potential for a bias toward optimism on their part. This bias is particularly inappropriate at a time when the short-range financing of the social security program is so fragile. It is important that all the assumptions be chosen in as unbiased a way as possible so that Congress and the American public understand as clearly as possible what the financing issues are. The board of directors of the American Academy of Actuaries recognized the importance of this matter when it adopted in 1980 the following resolution: "Whereas actuarial projections and cost estimates based on work of the highest professional quality and integrity have been an important force for fiscal prudence in the historical development of social insurance programs; and whereas the growth of these programs and their commitments to future generations of beneficiaries make it more important than ever that these programs be managed in a fiscally prudent manner; therefore, be it resolved that this organization believes that it is in the best interest of the public that the actuaries who are responsible for the projections and cost estimates be free to use their best professional judgment and expertise independent of pressures for political expediency and that the actuaries responsible for this work be required to issue an opinion letter accompanying the annual report stating whether the actuarial assumptions used in the projections contained therein are (a) in the aggregate reasonable taking into account the experience and expectation of the plan, and (b) represent the best estimates of anticipated experience of the plan." It should also be noted that the National Commission on Social Security made a similar recommendation in its report.

The question remains whether the economic experience of the 1970s should be expected to continue into the decade of the 1980s. In a separate discussion, John Wilkin is presenting an analysis relevant to this question.

It is interesting and instructive, however, to review the economic assumptions made in preparing the various trustees' reports of the 1970s, the extent to which they proved to be overly optimistic, and the implications of making similar errors in setting the economic assumptions for current trustees' reports.

The three economic assumptions to which the trust fund projections are most sensitive are: the general benefit increase that takes place in July of each year based on the increase of the average Consumer Price Index for the first quarter of that year over the first quarter of the preceding year; the increase in average wages in covered employment; and the average annual unemployment rate. Table 1 of this discussion shows the assumptions that were made with respect to the latter two variables and the prior year's increase in the CPI in the 1974 and 1975 trustees' reports, and it also shows the actual experience figures.

The economic assumptions in the 1974 and 1975 reports were chosen from the reports of the 1970s because the differences between the actual and the assumed experience in the economic variables have the greatest and the least effect, respectively, on projected trust fund ratios if they were to reoccur with respect to current projections.

To show the sensitivity of the trust fund projections to the errors that occurred in these reports, I have taken our current short-range projections and made up alternative projections. Each projection is based on alternative economic assumptions determined by changing the standard assumptions by the amount of the errors year-by-year that in fact occurred in setting the assumptions for the 1974 and 1975 trustees' reports. Table 2 shows the intermediate short-range economic assumptions of the 1980 trustees' report,

TABLE 1

ACTUAL VALUES OF PRINCIPAL ECONOMIC ASSUMPTIONS FOR
1974 AND 1975 OASDI TRUSTEES' REPORTS

YEAR	ACTUAL EXPERIENCE			1974 TRUSTEES' REPORT			1975 TRUSTEES' REPORT		
	Increase in Consumer Price Index	Average Annual Unemployment	Increase in Average Covered Wages	Increase in Consumer Price Index	Average Annual Unemployment	Increase in Average Covered Wages	Increase in Consumer Price Index	Average Annual Unemployment	Increase in Average Covered Wages
1974 ..	11.0%	5.6%	7.4%	9.1%	5.8%	7.9%	.....	.....	.....
1975 ..	9.1	8.5	6.6	5.7	5.8	8.5	9.0%	8.8%	6.2%
1976 ..	5.8	7.7	7.9	4.5	4.8	8.0	6.6	8.0	9.0
1977 ..	6.5	7.0	7.3	3.2	4.5	7.6	6.5	7.0	11.0
1978 ..	7.6	6.0	8.0	3.0	4.5	5.5	5.7	6.2	8.8
1979 ..	11.5	5.8	9.2	.....	.....	.....	4.6	5.4	7.7

TABLE 2

PRINCIPAL ECONOMIC ASSUMPTIONS OF 1980 OASDI TRUSTEES' REPORT AND
ALTERNATIVE ASSUMPTIONS BASED ON PRIOR FORECASTING ERRORS

YEAR	1980 INTERMEDIATE			ALTERNATIVE BASED ON 1974 REPORT ERRORS			ALTERNATIVE BASED ON 1975 REPORT ERRORS		
	General Benefit Increase	Average Annual Unem- ployment Rate	Increase in Average Covered Wages	General Benefit Increase	Average Annual Unem- ployment Rate	Increase in Average Covered Wages	General Benefit Increase	Average Annual Unem- ployment Rate	Increase in Average Covered Wages
1980 ..	14.3%	7.2%	9.6%	14.3%	7.0%	9.1%	14.3%	6.9%	10.0%
1981 ..	11.3	7.9	9.5	13.2	10.6	7.6	11.1	7.6	8.4
1982 ..	9.0	7.3	10.9	12.4	10.2	10.8	10.4	7.3	7.2
1983 ..	8.8	6.6	9.9	10.1	9.1	9.6	10.1	6.4	9.1
1984 ..	8.3	6.2	9.4	11.6	7.7	11.9	14.5	6.6	10.9
1985 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....

as well as the resulting alternative assumptions. Table 3 shows the emerging trust fund ratios for the OASDI trust funds under the 1980 intermediate assumptions and the alternative assumptions.

A similar analysis made on the experience of the 1960s would likely show a less biased result; that is, the errors in setting assumptions would not have been so consistently in one direction. Unfortunately, insufficient information exists to extend the analysis to trustees' reports prior to 1970. The limited results do, however, indicate the consequences of errors in setting economic assumptions and can serve as a basis for judgments about setting pessimistic assumptions and trust fund target ratios.

Again, let me congratulate the authors for a timely article that opens up this most important subject to broader debate.

TABLE 3

TRUST FUND RATIOS BASED ON ALTERNATIVE
ASSUMPTIONS OF TABLE 2

Year	1980 Intermediate	Alternative (1974)	Alternative (1975)
1980	24%	24%	24%
1981	18	18	19
1982	12	5	13
1983	8	- 9	5
1984	4	- 25	- 4
1985	*	- 40	- 14

* Less than 0.5 percent.

JOHN C. WILKIN:

Messrs. King and Powell have raised a timely issue and have highlighted the volatility and importance of the assumed gain in real earnings in projecting the financial status of the social security trust funds. However, their paper does not clearly delineate the responsibilities as they exist for preparing the trustees' reports, it incorrectly conveys the procedure followed in determining the assumptions to be used in the reports, and it is inadequately researched.

The *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds* (commonly called the OASDI trustees' report) is a report to Congress on the financial status of the social security program. Although the selection of many of the assumptions and the projection of the financial status of the trust funds is delegated to the Office of the Actuary, the board of trustees (consisting of the secretaries of the Treasury, Labor, and Health and Human Services) is ultimately responsible for the report. The responsibility for choosing many of the demographic and other assumptions about program operations naturally falls almost entirely on the actuaries because of their program knowledge and their actuarial expertise. The choice of economic assumptions, however, is not so clearly the domain solely of the actuaries. The trustees have at their disposal many experts in the field of economics in their own departments and in other parts of the executive branch as well. Also, a desire to have all of the federal administration operate under a common set of economic assumptions necessitates close adherence in the early years to the administration's official budget assumptions, prepared by the Office of Management and Budget.

Traditionally, the detailed economic assumptions for the first ten years have been produced by economists in the Office of Research and Statistics (SSA) in consultation with both SSA and HCFA actuaries. This is done under the constraints of the administration's budget assumptions for the first two years and within the general trend of the potential gross national product projected for the third through sixth years by the council of economic advisors. All of these assumptions are discussed in meetings of the staffs of the trustees, in which both the SSA and HCFA actuaries participate. The final assumptions are of course subject to the approval of the trustees themselves.

From the process described above, one cannot conclude that the short-range economic assumptions presented in the recent trustees' reports were developed single-handedly by the actuaries in SSA. In fact, the actuaries' opinions on the first two years were unimportant, since these years were based on the budget assumptions. And, as a group, the SSA actuaries believe

that the assumptions on which they had some influence were reasonable at the time they were prepared. It should be noted that the 1976, 1977, and 1978 reports were prepared while either Mr. King or Mr. Powell or both were employed by the Social Security Administration. Since the assumptions used in the 1980 reports are more conservative than those used in earlier reports, I wonder why Messrs. King and Powell decided to voice objections to the assumptions at this time. It might be that their hindsight, like everybody's, is better than their foresight.

I fear that Messrs. King and Powell may leave the impression that our analysis is superficial and that we are not open to suggestions for improvement. In fact, considerable progress is being made in our analysis, and we are continually examining our techniques and data for further enlightenment. One thing we have definitely learned about the economic field, however, is that no matter what the quality of the analysis, honest differences of opinion are likely to occur.

The technical analysis presented by Messrs. King and Powell does little to improve the development of assumptions for future reports. A desire to be more influential on the choice of the short-range economic assumptions should lead to a clearer demonstration of capability in this area rather than to a public display of dissatisfaction with recent results. One should not expect the overly simplified trend analysis presented in their paper to best predict the 1980s based on the 1970s, any more than it would have best predicted the 1970s based on the 1960s, or any other decade based on the previous one.

The discussion of the factors that the SSA actuaries did consider, and those factors that Messrs. King and Powell think should have been considered when projecting the gain in real earnings, exemplifies the overly simplified analysis that underlies their paper. For example, the price of a barrel of OPEC oil increased from \$1.30 in 1970 to around \$32.00 in 1980, a 2,362 percent increase. A continuation of this trend would result in a barrel of OPEC oil's costing \$788.00 in 1990, an unlikely level. Yet our belief that energy prices cannot reasonably be assumed to continue to escalate as in the 1970s was characterized in the paper as hypothesizing "extremely favorable developments in the area of energy cost and availability."

Also, although the CPI may not be the best measure of the "underlying rate of inflation" (however that may be defined), its shortcomings are irrelevant for our purposes. Whatever the imperfections in the CPI, it is the measure used to index social security benefits, and it is the one that must be used in our analysis of gains in real earnings. If a different measure had been chosen for indexing benefits, then we would have used that measure in analyzing the gain in real earnings.

Messrs. King and Powell allude to factors that affect gains in real earnings.

These factors include productivity, the age-sex composition of the labor force, and the proportion of employee compensation provided as wages. Their paper would have been much stronger if the relationship among these factors and the gain in real earnings had been presented in the context of a cohesive analysis, including historical data on these factors and comments on their likely future course. Without making a point-by-point rebuttal, a very brief description of our analysis should make clearer my objections to their presentation.

To aid in projecting the annual gain in real earnings, a time series of historical data is collected. Ideally, these data should then be normalized—that is, adjusted quantitatively relative to some chosen standard to reflect the effects of the major characteristics of the past that may have masked any underlying trend. The analysis of past trends and the projection of future trends are based on the normalized data. After the normalized data have been projected, they must be “unnormalized”—that is, adjusted quantitatively to reflect the effects of the expected major characteristics of the future relative to the previously chosen standard. Unfortunately, while determining the major characteristics that influence a time series is difficult, quantifying the effects of these factors is often even more difficult. We have done some analysis to quantify the effects of changes in the age-sex composition of covered workers on the annual gain in real earnings. Future improvements in our methods can be expected.

In arriving at our recommended ultimate assumption on gains in real earnings, two different analyses were used. The first examined experience on the gain in real earnings directly. The second examined recent experience on productivity, real earnings, and the linkages between them.

Gain in Real Earnings

Table 1 of this discussion shows the average annual earnings of covered workers indexed to 1967 by the CPI. Also shown is the average annual gain over selected intervals. Although the yearly gain in real earnings has fluctuated between an estimated loss of 4.4 percent in 1980 and a gain of 4.8 percent in 1956, the ten- or fifteen-year averages show that the general trend since the mid-1960s has been downward. Few analysts believe, however, that the gain in real earnings will follow a monotonically decreasing (or increasing) path indefinitely. Table 2 shows the average annual gain in real earnings, adjusted to the 1970 age-sex distribution of covered workers. The normalized experience from 1951 to 1980 was an average annual gain of 1.44 percent, or 0.14 percent more than the actual experience of 1.30 percent. Although this demographic effect depressed past gains in real earnings, our analysis of the expected future age-sex distribution of covered workers

shows that to "unnormalize" the projection, roughly 0.5 percent should be added to the annual gain in real earnings from 1980 through the mid-1990s, after which time the adjustment should become negligible. These adjustments reflect the effects of the baby-boom generation and increased numbers of women entering the labor force, the effects of which will diminish in the 1990s.

Productivity and Its Relation to Gain in Real Earnings

Over a long period of time, gains in real earnings are virtually impossible to attain without gains in productivity. The relationship between productiv-

TABLE 1
REAL EARNINGS (1967 DOLLARS) AND AVERAGE ANNUAL GAIN
OVER SELECTED INTERVALS, 1951-80

YEAR	REAL EARNINGS	AVERAGE ANNUAL GAIN OVER FOLLOWING NUMBER OF YEARS					
		1	5	10	15	20	29
1951	\$3,116.17						
1952	3,217.29	3.25%					
1953	3,399.00	5.65					
1954	3,445.58	1.37					
1955	3,589.14	4.17					
1956	3,760.28	4.77	3.83%				
1957	3,768.10	0.21	3.21				
1958	3,751.01	-0.45	1.99				
1959	3,908.56	4.20	2.55				
1960	3,974.06	1.68	2.06				
1961	3,987.72	0.34	1.18	2.50%			
1962	4,127.77	3.51	1.84	2.52			
1963	4,195.10	1.63	2.26	2.13			
1964	4,332.44	3.27	2.08	2.32			
1965	4,368.25	0.83	1.91	1.98			
1966	4,486.38	2.70	2.38	1.78	2.46%		
1967	4,603.00	2.60	2.20	2.02	2.42		
1968	4,698.66	2.08	2.29	2.28	2.18		
1969	4,759.56	1.30	1.90	1.99	2.18		
1970	4,715.39	-0.93	1.54	1.73	1.84		
1971	4,743.61	0.60	1.12	1.75	1.56	2.12%	
1972	4,928.17	3.89	1.37	1.79	1.81	2.16	
1973	4,958.68	0.62	1.08	1.69	1.88	1.91	
1974	4,797.56	-3.25	0.16	1.02	1.38	1.67	
1975	4,684.24	-2.36	-0.13	0.70	1.10	1.34	
1976	4,778.30	2.01	0.15	0.63	1.21	1.21	
1977	4,816.53	0.80	-0.46	0.45	1.03	1.23	
1978	4,833.59	0.35	-0.51	0.28	0.95	1.28	
1979	4,738.17	-1.97	-0.25	-0.05	0.60	0.97	
1980	4,530.77	-4.38	-0.66	-0.40	0.24	0.66	1.30%

TABLE 2

REAL EARNINGS (1967 DOLLARS) AGE-SEX-ADJUSTED TO 1970
COVERED WORKERS AND AVERAGE ANNUAL GAIN
OVER SELECTED INTERVALS, 1951-80

YEAR	REAL EARNINGS	AVERAGE ANNUAL GAIN OVER FOLLOWING NUMBER OF YEARS					
		1	5	10	15	20	29
1951	\$3,010.46						
1952	3,084.88	2.47%					
1953	3,234.52	4.85					
1954	3,253.92	0.60					
1955	3,363.53	3.37					
1956	3,528.22	4.90	3.22%				
1957	3,539.86	0.33	2.79				
1958	3,528.09	-0.33	1.75				
1959	3,680.75	4.33	2.50				
1960	3,746.97	1.80	2.18				
1961	3,755.08	0.22	1.25	2.23%			
1962	3,901.61	3.90	1.97	2.38			
1963	3,976.43	1.92	2.42	2.09			
1964	4,144.40	4.22	2.40	2.45			
1965	4,238.86	2.28	2.50	2.34			
1966	4,410.37	4.05	3.27	2.26	2.58%		
1967	4,533.57	2.79	3.05	2.51	2.60		
1968	4,660.15	2.79	3.22	2.82	2.46		
1969	4,758.46	2.11	2.80	2.60	2.57		
1970	4,715.39	-0.91	2.15	2.33	2.28		
1971	4,745.83	0.65	1.48	2.37	2.00	2.30%	
1972	4,959.12	4.49	1.81	2.43	2.27	2.40	
1973	5,036.62	1.56	1.57	2.39	2.40	2.24	
1974	4,871.29	-3.28	0.47	1.63	1.89	2.04	
1975	4,729.72	-2.91	0.06	1.10	1.56	1.72	
1976	4,833.71	2.20	0.37	0.92	1.70	1.59	
1977	4,905.98	1.50	-0.22	0.79	1.54	1.65	
1978	4,902.67	-0.07	-0.54	0.51	1.41	1.66	
1979	4,785.71	-2.39	-0.35	0.06	0.96	1.32	
1980	4,557.00	-4.78	-0.74	-0.34	0.48	0.98	1.44%

ity (production per hour) and earnings (wages per year) can best be summarized mathematically by the following formula:

$$\frac{\text{Production}}{\text{Hour}} \times \frac{\text{Compensation}}{\text{Production}} \times \frac{\text{Wages}}{\text{Compensation}}$$

$$\times \frac{\text{Hours}}{\text{Week}} \times \frac{\text{Weeks}}{\text{Year}} = \frac{\text{Wages}}{\text{Year}}$$

Additional insight into the gain in real earnings can be obtained by analyzing gains in productivity and changes over time in each of the above linkages. Table 3 summarizes the average annual changes in productivity, real earnings, and their linkages, over the period 1951-80.

Table 3 shows that much of the decrease in the gain in real earnings during the 1970s is the result of increases in the linkages, and that gains in productivity have not fallen as much as gains in real earnings. In the long run, this trend—of a larger portion of the increases in productivity being absorbed in the linkages—must reverse. If fringe benefits continually increase faster than wages, then the fringe benefits will eventually represent almost all of employees' compensation. If the number of hours that employees work during the year continually decreases without bound then eventually workers will not work at all. Even so, in our long-range projection we assumed that wages as a proportion of employee compensation, which declined from 95 percent in 1951 to 84 percent in 1980, would continue to decline at an average annual rate of 0.4 percent, reaching 62 percent in 2055. We also assumed that the average number of hours worked per week, which has declined from 39.9 in 1951 to 35.3 in 1980, would continue to decline at an average annual rate of 0.25 percent, reaching 29.2 in 2055.

Over the long run, these linkages can be expected to have a stabilizing effect on the gain in real earnings, because workers' preferences for increases in wages (as opposed to increases in fringe benefits or decreases in hours) likely would run counter to the trend in productivity. For example, because of the recent decline in real wages, in the near future workers may well prefer cash to fringe benefits in compensation negotiations.

From 1947 to 1968 the productivity of American workers increased at an average rate of 3.2 percent per year. Since 1968 the rate of improvement

TABLE 3
AVERAGE ANNUAL CHANGE IN PRODUCTIVITY, REAL EARNINGS, AND
THEIR LINKAGES, 1951-80

ITEM	AVERAGE ANNUAL CHANGE OVER PERIOD			
	1951-60	1960-70	1970-80	1951-80
Productivity	2.58%	2.84%	1.40%	2.26%
Compensation/production	0.69%	0.57%	-0.15%	0.36%
Wages/compensation	-0.29	-0.28	-0.63	-0.40
Hours/week	-0.37	-0.40	-0.50	-0.42
Weeks/year and residual	0.13	-1.00	-0.57	-0.52
Total linkages	0.16%	-1.11%	-1.80%	-0.98%
Real earnings	2.74%	1.73%	-0.40%	1.30%

has been 1.3 percent per year. Is the long-range increase somewhere between these two values, or does the recent decrease represent a general downward trend from which our economy is unlikely to recover?

Many economists have studied the recent deceleration of productivity in the United States, and a consensus has emerged as to the major factors that have adversely affected productivity. These include (1) the changing demographic distribution of the work force; (2) increased government regulation; (3) the economic disruptions caused by high inflation, energy shortages, and price increases; and (4) a decline in the rate of investment.

The changing age-sex composition of the work force, as suggested by its effect on real earnings, has lowered the average "quality" of the work force. The average age and experience level of the work force will increase during the 1980s, thus reversing the trend in the average "quality" of workers. In addition, the rate of increase in total employment increased during the 1970s to 2.4 percent per year from a level of 1.4 percent per year during the 1950s and 1960s. This, coupled with the decline in the rate of investment, resulted in very little growth in the capital/labor ratio during the last decade. Labor force growth will slow significantly over the next decade, the result of a rapidly dwindling teenage population and an expected leveling of female labor force participation rates. This should contribute to a resumption in the growth of the capital/labor ratio.

Although new regulations adversely affected productivity in the 1970s, it should be noted that the initial effect of a new regulation does not remain permanent. While an industry is adapting to a new regulation, the rate of growth in productivity will decrease. However, once the adaptation is completed, the rate of growth in productivity should increase. Only if a continual stream of new regulations is produced at the same high rate as in the 1970s will the recent effect on productivity continue. Since the new administration is more inclined to take into account the costs of new regulations (indeed, no administration would be likely to impede productivity as in the 1970s indefinitely), a deceleration or even a decline in environmental and safety regulation seems likely, thus aiding future gains in productivity.

In the long run, inflationary pressures should ease from the levels experienced during the 1970s. This will make it easier to finance capital formation and, in addition, will provide an economic climate more conducive to investment. Government policy also can be expected to stimulate investment. Increased depreciation allowances and investment tax credits will provide funds for investment, and a slowdown in new regulations should allow a greater proportion of new investment to be directed at increases in productivity. Therefore, capital formation, and especially productive capi-

tal, can be expected to increase faster than in the 1970s. This will result in a quicker embodiment of current technology in the capital stock.

Many of the factors that contributed to slow growth in productivity and a decline in real earnings during the 1970s will take time to stabilize or reverse; thus improvement over the 1970s experience during the early 1980s should be expected to be gradual. In particular, the path to the ultimate assumptions could be hampered by continued high inflation and disruptions in energy supplies (although this seems less likely now than it did when the assumptions for the 1980 trustees' reports were being formulated). Restrictive fiscal and monetary policy should also slow short-range growth, while laying the foundation for future gains. However, other factors, as mentioned above, have already begun to change in a direction that should make the latter half of the 1980s better than the 1970s.

(AUTHORS' REVIEW OF DISCUSSION)

ROLAND E. KING AND C. KEITH POWELL:

Mr. Savord's comments on the long-range or ultimate real earnings assumptions are indeed thought-provoking. Several of the major independent economists agree with Mr. Savord. It is not at all clear that the economic experience of the next thirty years should be assumed to be more favorable than that of the last thirty years.

We would like to thank Mr. Myers for his thoughtful comments. He has correctly pointed out that the SMI program is generally funded on an actuarially sound basis. It is also worth noting that, because of the nature of the SMI program, the financing of the program is not determined on the basis of assumptions tied directly to the administration's budget assumptions. This likely has been an important factor contributing to the actuarial soundness of the SMI program.

Mr. Myers has asserted that economic conditions can have sharp discontinuities and suggests that the future could bring a very different trend of real earnings gains from what has been observed in the past. We do not disagree with this conclusion, but question whether actuarial projections of the social security programs should rely on such discontinuities. In any case, our analysis has shown that the downward trend in real earnings increases has been relatively steady despite sharp discontinuities in economic conditions in the past. Nevertheless, we would have been willing to accept the sharp upturn in real earnings gains projected in the 1980 trustees' reports if there had been reason to believe that such a sharp upturn would occur.

Mr. Myers is quite correct in his conjecture that we would find the Reagan

administration's budget assumptions too optimistic for projecting the actuarial status of the social security program. We view them as management goals. It is noteworthy that the Reagan administration has wisely chosen not to use these assumptions as a basis for establishing financing for the social security program, and, in fact, has prudently recommended that the program be financed (at least for the next five years) on the basis of assumptions that are considerably more pessimistic than the 1980 trustees' report assumptions which we challenged.

We wish to thank Mr. Bartlett for his comments, which provide insights into the unique political problems with which government actuaries must deal. We would like to reply to Mr. Bartlett's discussion point by point. In some cases we disagree with him, and in other cases his remarks would be misleading without further explanation.

1. We disagree with Mr. Bartlett's assertion that trust fund ratios provide a good measure of the adequacy of short-term financing and the effect of erroneous assumptions. Since social security is financed on a current-cost basis, the *financing* of social security is provided by current income; the trust funds, of course, serve only as contingency reserves, not a source of financing. Thus, a comparison of current income and current disbursement projections gives the most complete picture of the adequacy of short-range financing and demonstrates most clearly the effect of erroneous assumptions.

2. Mr. Bartlett's point is well taken. It is possible that a presentation of the 1977 assumptions would have helped to illustrate more clearly the sensitivity of the social security program to erroneous assumptions, as Mr. Bartlett suggests.

3. We are surprised by Mr. Bartlett's criticism of us for failing "to state what, in their view, would have been more appropriate assumptions, along with an analysis to support such alternatives." It is not logically necessary to present alternatives in order to make a case that a particular set of assumptions is inappropriate. We stated our opinion, with appropriate analysis, that the 1980 trustees' report assumptions are unjustifiably optimistic. Mr. Bartlett neither refuted that analysis nor defended the 1980 trustees' report assumptions. It would have been appropriate for Mr. Bartlett to present a technical analysis to justify the dramatic revision in the assumptions, which, he pointed out, was made shortly after the trustees' report was published.

4. The statement that Mr. Bartlett quoted from the 1980 OASDI trustees' report was actually inserted in the reports as a last-minute compromise. After the projections had been completed under the assumptions recommended by Mr. Bartlett, economic advisers to the secretary of the Treasury (whom we had succeeded in convincing that the assumptions were overly optimistic) requested that more conservative revised assumptions be developed for the trustees' report projections. However, the Social Security Administration refused to change the assumptions. As a compromise, the statement referred to by Mr. Bartlett was inserted in the OASDI and HI trustees' reports. No such statement, however, was inserted in a summary of the trustees' reports prepared by the actuarial staff of SSA as part of a public relations effort to

convince the public that the social security program was not in serious financial trouble.

Although revised projections were prepared a short time after the trustees' reports were issued, the revised projections were based on assumptions developed by the Council of Economic Advisors for use by the Office of Management and Budget (OMB) in preparing the OMB midsession review of the federal budget. The Social Security Administration played no part in the development of those economic assumptions. Moreover, the projections associated with the midsession review, while available to Congress and the general public, do not constitute a report to Congress on the financial status of the trust funds and are not used in that context.

5. We do not wholly agree with Mr. Bartlett's assessment that the current financing problems of the social security program are the result of congressional decisions made in apparent disregard of the advice of the actuaries. While it is not our intent to criticize the actuarial work performed in connection with the 1977 amendments, it is only fair to point out that the actuarial report provided to Congress in connection with the 1977 amendments did not include short-range projections of either trust fund ratios or income and disbursements under pessimistic assumptions. Nor did it include any suggestion that the projected trust fund ratios contained in the report might provide an inadequate contingency margin. The 1978 trustees' report, which Mr. Bartlett suggests shows "that the OASI trust fund stood a good chance of being exhausted by 1985," actually stated that "the Social Security Amendments of 1977 have restored the financial soundness of the cash benefits programs over the short-range and medium-range periods, beginning in 1981, and greatly improved the long-range actuarial status." The message was clear, and in no way pessimistic. The actual experience since the 1978 trustees' report has, in fact, turned out to be significantly worse than even the *pessimistic* assumptions indicated.

6. Mr. Bartlett has presented an excellent description of the immense difficulties involved in arriving at a consensus set of economic assumptions for the trustees' reports. These difficulties, however, do not mitigate the responsibility of the actuary (1) to recommend appropriate assumptions to the trustees and (2) to submit an appropriate and explicit qualification of his findings if inappropriate assumptions are adopted. The failure to qualify projections based on inappropriate assumptions constitutes a tacit endorsement of those assumptions. This is a role we could not accept; hence our qualification of our projections under the 1980 trustees' report assumptions.

Finally, Mr. Bartlett states: "The question remains whether the economic experience of the 1970s should be expected to continue into the decade of the 1980s." A more appropriate question is, "Do the 1980 trustees' report assumptions constitute a prudent and realistic basis for projecting the financial status of the social security program?" As time goes on, it becomes increasingly apparent that the answer to that question is no.

The tone of Mr. Wilkin's remarks is indicative of the attitude that necessitated our paper. We have several specific comments on Mr. Wilkin's discussion.

We disagree with Mr. Wilkin's assertion that our paper "does not clearly delineate the responsibilities as they exist for preparing the trustees' reports." We stated that the HCFA actuaries are responsible for preparing the HI and SMI reports and the SSA actuaries are responsible for preparing the OASDI report. This is correct and seems clear to us.

Mr. Wilkin criticizes our paper because "it incorrectly conveys the procedure followed in determining the assumptions to be used in the reports." We did not discuss the procedure followed in determining the assumptions to be used in the reports, so we are confused by Mr. Wilkin's criticism. It should be pointed out, however, that Mr. Wilkin's discussion of this procedure is misleading. First, the real earnings gains used in the 1980 reports were *precisely* those recommended in writing by the chief actuary of SSA. Second, Mr. Wilkin's discussion leaves the false impression that real earnings assumptions are determined by the Council of Economic Advisors (CEA) or by the Office of Management and Budget (OMB). Real earnings assumptions are not specified by CEA or OMB. CEA and OMB specify, at most, certain parameters such as CPI and GNP. The actuaries exercise considerable discretion in determining real earnings increases that are reasonably consistent with these parameters. Actually, in 1980 the real earnings assumptions were determined entirely by the SSA actuaries. During discussions of the assumptions, the economists in the Office of Research and Statistics in SSA complained that the real earnings increases specified by the actuaries were producing certain anomalies in their econometric model, such as actual GNP exceeding potential GNP. The SSA actuaries ignored this warning that real earnings were too high and went forward with the anomalous assumptions. Third, Mr. Wilkin's point that the trustees must finally approve the assumptions is really irrelevant, since the SSA actuaries had the option of qualifying their projections just as we did.

Mr. Wilkin states that our paper is inadequately researched. We believe that our paper was adequately researched for its purposes, which were to point out our reasons for not being able to endorse the 1980 trustees' report assumptions and to point out the inappropriateness of using overly optimistic economic assumptions in projecting the actuarial status of the social security program.

Mr. Wilkin's suggestion that our criticism of the 1980 trustees' report assumptions was an act of hindsight rather than foresight is, of course, incorrect. As we have already pointed out, we disavowed the assumptions *before* the trustees' reports were published. We had also expressed dissatisfaction (privately, but without success) with the overoptimism of the economic assumptions being used in the trustees' reports in previous years. However, the tone of Mr. Wilkin's remarks is an indication of the manner in which our suggestions for improvement were received.

In an attempt to exemplify the overly simplistic nature of our analysis, Mr. Wilkin points out that the price of OPEC oil increased by 2,362 percent from 1970 to 1980. But he fails to follow up with an analysis of what effect this increase had on the CPI during that period, and does not discuss the effect that the energy situation could have on the economy during the next few years. During the period 1970-80 the price of gasoline, for example, increased by 255 percent, far less than the price of OPEC oil. There are several reasons why, during the next few years, the CPI will not be as well insulated from OPEC price increases as during the period 1970-80. First, oil prices were controlled during that period, so that the full impact of OPEC price increases had not been passed through to the consumer by 1980. Second, OPEC imports constituted less than 25 percent of our oil consumption in 1970 but constituted 40-45 percent of our oil consumption in 1980. Third, in 1970 fixed costs and other costs, which were not directly affected by oil prices, constituted a much larger proportion of the cost of gasoline than in 1980. Fourth, the gasoline component of the CPI has a heavier weight in 1980 than it did in 1970. Fifth, it is likely that the cost of domestically produced oil will eventually rise to the OPEC price level. It will take some time for these price increases and all their ripple effects to work their way through the economy and be fully reflected in the CPI. If Mr. Wilkin had considered these factors, he would have realized that the CPI is no longer as well insulated from the effects of increases in the price of OPEC oil as it was in 1970. In any case, it would not require a 2,362 percent increase in the price of OPEC oil for the economic experience of the 1980s to be considerably worse than that projected in the 1980 trustees' report.

In his haste to criticize our assertion that the CPI overstates inflation, thus reducing real earnings gains, Mr. Wilkin has missed the point completely. The consequences of the failure to understand this point are exemplified by Mr. Wilkin's analysis of the relationship between productivity and real earnings gains. Productivity is measured as the ratio of constant-dollar gross domestic product (GDP) to hours of labor input. The GDP is converted to a constant-dollar amount by an implicit price deflator. This implicit price deflator is significantly different from the CPI in several ways. First, the weights in this index are updated constantly as production changes, while the weights in the CPI are based on the concept of a fixed market basket based on a survey of consumer expenditures conducted in 1972-73. Second, the implicit price deflator measures only changes in the prices of domestically produced products, while the CPI measures price increases in all goods. Third, the implicit price deflator measures price changes only in currently produced items, while the CPI measures price changes in used items as well. Fourth, and most important, the cost of

homeownership has a significant impact on the CPI, accounting for nearly one-quarter of the index. For example, during 1977, 1978, and 1979 the cost of homeownership added 0.7, 1.0, and 2.0 percent, respectively, to the CPI increase. Homeownership plays a much less significant role in the implicit price deflator for GDP, since only new construction is reflected in the weight.

Because of these significant differences between the implicit price deflator and the CPI, shifts in the level of production from one industry to another can have different effects on productivity and real earnings increases.

Because Mr. Wilkin failed to recognize the important differences between the CPI and the implicit price deflator for GDP, he did not properly conceptualize his historical analysis of the relationship between productivity and real earnings gains. It is likely that this is partly the reason for the erroneous 1980 trustees' report assumptions.

In any case, the shortcomings of the CPI are *not* irrelevant, even though "it is the measure used to index social security benefits." The CPI has recently come to overstate inflation. Hence, we can no longer count on the benefit index, the CPI, maintaining a reasonable relationship to wage and revenue growth. A slow long-term correction of these flaws will not have much impact through the mid-1980s.

In his direct analysis of gain in real earnings, Mr. Wilkin adjusts average annual gains in real earnings for the age-sex distribution of covered workers. Most economists agree that age does not have a direct effect on an individual's wages. Age is, at best, a poor proxy for experience cohort, which is a much better indicator of earnings increase potential. Using age as a proxy for experience cohort can also cause serious distortions when older women are entering the work force in large numbers as they did during the 1970s. For example, a woman aged 45 who has just entered the work force would implicitly be put in the same experience cohort as a woman aged 45 with twenty years' experience, yet one would not expect the two women to have the same earnings potential. Sex also is an inappropriate indicator of future earnings potential. It is likely that patterns of real wage growth for women will change dramatically as they continue to move into traditionally male-dominated occupations.

Many studies have been done on the effects of various demographic factors on real wage growth. The latest—*Patterns of Real Wage Growth, 1967-1977: Who Has Prospered?*—was published by the Bureau of Labor Statistics in 1980. This study examines real wage growth for (1) whites versus nonwhites, (2) high school versus college graduates, (3) various work experience cohorts, (4) various regions, and (5) union versus nonunion workers. It shows striking differences in real wage growth between these categories. For example: nonwhite wages were found to grow 0.7 percent

per year faster than white wages; wages for high school graduates were found to grow 1.39 percent per year faster than wages for college graduates; wages for union workers were found to grow 0.45 percent per year faster than wages for nonunion workers; wages for experienced workers were found to increase 0.52–0.75 percent per year faster than wages for inexperienced workers. Another study, "The Effect of Demographic Factors on Age-Earnings Profiles," published in the *Journal of Human Resources* in 1979, suggests that the experience cohort of workers entering the work force with the post-World War II baby boom will suffer a permanent reduction in real earnings gains—a conclusion that, if valid, could have a significant impact on future increases in real earnings. The studies we have mentioned, or similar studies, would likely prove far more useful for projecting future real earnings increases than Mr. Wilkin's conceptually flawed age-sex normalization. Yet Mr. Wilkin appears to be blissfully unaware of their existence.

Thus, while Mr. Wilkin hypothesizes that the changing age-sex mix will have a beneficial effect on the economy, we are not confident that the suggested relationship to economic growth is sufficiently well established to serve as a basis for reaching his conclusions about the future. In any case, it is not clear that such effects would develop in time to have a strong impact through the mid-1980s. Like Mr. Wilkin, we hope for favorable changes in the areas of regulation, inflation, and capital formation, but our reading leaves us less optimistic than Mr. Wilkin about the timing and magnitude of such effects through the mid-1980s.

Mr. Wilkin criticizes our analysis as being "overly simplified." We believe that a simple analysis that assists one in arriving at valid and reasonable conclusions is superior to an analysis that is complex but conceptually flawed.

Any well-conceived methodology for determining actuarial assumptions is based on (1) an examination of historical trends, (2) an attempt to explain what factors affected those trends in the past, and (3) an attempt to foresee how those factors may change or what new factors may come into play to affect future trends. It also seems logical, for short-range projections, to give heavier weight to more recent experience. The degree of conservatism that should be embodied in the assumptions depends on the risks that arise from erroneous assumptions and also on the level of uncertainty in the assumptions. Thus, selecting a set of actuarial assumptions is not only an exercise in predicting the future but also an exercise in planning the basis for future financing. In the case of the social security programs, the risks arising from overoptimistic assumptions are considerable—inequities among generations, impending bankruptcy of the program, and the resulting loss

of public confidence in the program. Likewise, the level of uncertainty in the principal assumptions is demonstrably large.

During the twenty-nine-year historical period 1952-80 (which included the boom periods of the early fifties and early sixties), real earnings increased at an average annual rate of 1.3 percent, and the rate of increase has been declining. Mr. Wilkin chose to ignore this historical experience and concluded in 1980 that (1) the ultimate or long-range real earnings increase would average 1.7 percent, or 0.4 percent per year higher than historical experience, and (2), during the next ten years, real earnings increases would average 1.3 percent, about the same as during the last twenty-nine years. In order to justify these conclusions, one would logically have to be able to explain (1) why real wages declined so rapidly during the 1970s and (2) why they are projected to recover so dramatically during the 1980s. Since he has failed to answer these two fundamental questions, Mr. Wilkin's analysis simply does not justify his conclusions.

It remains to be seen whether our conclusions with regard to the future course of real earnings increases will prove to be valid. However, while Mr. Wilkin has asserted that our analysis "does little to improve the development of assumptions for future reports," the trustees' report assumptions have already been revised to reflect the conclusions of our analysis. Even though the economic outlook has improved somewhat since May, 1980, the recommended real earnings assumptions for the 1981 trustees' reports have been reduced substantially. The ten-year projected real earnings gain of 6.7 percent used in the 1981 report is less than half the 13.7 percent gain used in the 1980 report. Although this assumption is somewhat greater than the ten-year real earnings gain assumption of zero percent which we had argued for in 1980, it is combined with a significantly higher unemployment assumption, which makes the overall 1981 assumptions significantly more pessimistic than the 1980 assumptions.

Tables 1 and 2 illustrate the significant differences in assumptions between the 1980 and the 1981 trustees' reports. Table 1 illustrates the changes in the economic assumptions, and Table 2 illustrates the impact of these changes on the cost projections (expressed as a percentage of taxable payroll). In interpreting the figures in table 2, one should consider that there are other factors that affect the changes in the estimated costs, such as legislation since the 1980 report, improvements in methodology, and changes in the demographic assumptions. The effect of these other factors, however, is less significant than the effect of the economic assumptions.

TABLE 1

COMPARISON OF ECONOMIC ASSUMPTIONS

CALENDAR YEAR	1980 TRUSTEES' REPORT (ALTERNATIVE II)		1981 TRUSTEES' REPORT (ALTERNATIVE II-B)	
	Real Wage Increase	Unemployment Rate	Real Wage Increase	Unemployment Rate
1981	-0.1%	7.9%	-0.8%	7.8%
1982	1.7	7.3	0.2	7.5
1983	1.2	6.6	0.6	7.2
1984	1.1	6.2	0.6	7.0
1985	1.2	5.9	0.7	6.8
1986	1.3	5.7	0.7	6.6
1987	1.6	5.5	0.9	6.4
1988	1.6	5.2	1.1	6.2
1989	1.6	5.0	1.2	6.0
1990	1.7	5.0	1.3	5.9
1991	1.7	5.0	1.4	5.8
1992	1.7	5.0	1.4	5.7
1993	1.7	5.0	1.4	5.6
1994	1.7	5.0	1.4	5.5
1995	1.7	5.0	1.4	5.4

TABLE 2

COMPARISON OF COST PROJECTIONS
(Percent of Taxable Payroll)

CALENDAR YEAR	OASDI		DI		HI		Total	
	1980 Trustees' Report (Alt. II)	1981 Trustees' Report (Alt. II-B)	1980 Trustees' Report (Alt. II)	1981 Trustees' Report (Alt. II-B)	1980 Trustees' Report (Alt. II)	1981 Trustees' Report (Alt. II-B)	1980 Trustees' Report (Alt. II)	1981 Trustees' Report (Alt. II-B)
1981	9.94%	9.89%	1.39%	1.41%	2.20%	2.27%	13.53%	13.57%
1982	9.97	10.08	1.35	1.36	2.27	2.36	13.59	13.80
1983	9.91	10.15	1.29	1.31	2.35	2.46	13.55	13.92
1984	9.86	10.29	1.26	1.28	2.44	2.58	13.56	14.15
1985	9.79	10.38	1.22	1.25	2.56	2.73	13.57	14.36
1986	9.74	10.49	1.20	1.23	2.69	2.88	13.63	14.60
1987	9.68	10.57	1.17	1.22	2.83	3.04	13.68	14.83
1988	9.60	10.63	1.16	1.23	2.98	3.20	13.74	15.06
1989	9.48	10.65	1.14	1.23	3.11	3.37	13.73	15.25
1990	9.39	10.64	1.13	1.23	3.26	3.55	13.78	15.42
1991	9.38	10.61	1.13	1.22	3.41	3.74	13.92	15.57
1992	9.37	10.57	1.13	1.22	3.57	3.95	14.07	15.74
1993	9.36	10.53	1.13	1.22	3.74	4.17	14.23	15.92
1994	9.35	10.48	1.14	1.23	3.88	4.35	14.37	16.06
1995	9.35	10.47	1.14	1.23	4.02	4.55	14.51	16.25

