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The Future of Social Security: An Update

SINCE ITS CREATION in 1935, the Social Security system has become an integral part of the U.S. economic and social structure. With the composition of the population currently undergoing substantial change, however, skepticism abounds among U.S. citizens (particularly those between 25 and 45 years old) as to whether the Social Security system, as currently structured, can survive into the middle of the 21st century.¹

In a recent issue of the *Wall Street Journal*, a 1990 Gallup poll indicated that "47% of Americans do not believe that Social Security will be able to pay them any benefit when they retire."² These results suggest that the public's thinking about the viability of Social Security has changed little over the last 10 years. Myers (1985) reports similar results for polls taken in 1980. This skepticism continues despite the 1983 enactment of the recommendations of President Reagan's National Commission on Social Security Reform.³ This legislation was designed to put the Social

Security system on sound financial footing until 2056.⁴

This article provides an update on the financial status of the Social Security system and addresses concern about its long-run financial viability.⁵ The fundamental economic and demographic assumptions that underlie estimates of the system's future costs and income are examined to determine the system's financial viability. This evaluation provides the basis for determining whether the skepticism about Social Security's future is justified.

THE 1983 SOCIAL SECURITY AMENDMENTS

The Social Security Act has been amended many times over the years, with the amendments changing coverage, insured status, benefit formulas and financing provisions. One of the most sweeping changes took place in 1984,

¹The challenges of an aging population are common in most industrial countries. See Halter and Hemming (1987).

²Rasmussen (1990).

³These were the 1983 amendments to the Social Security Act, which will be discussed further below.

⁴In February 1984, President Reagan, in his annual budget message, declared: "The Social Security system has been rescued from the threat of insolvency raised by rampant

inflation, excessive liberalizations, and lagging growth of its tax base." Office of Management and Budget (1984).

⁵Social Security is defined as Old-Age and Survivors Insurance (OASI), Disability Insurance (DI) and Hospital Insurance (HI), also referred to as Medicare, Part A. OASI + DI = OASDI and OASDI + HI = OASDHI. Supplementary Medical Insurance (SMI), also referred to as Medicare, Part B, is discussed only briefly since it is a voluntary program and not financed with the payroll tax.

following the passage of the 1983 amendments, which were based on the Report of the National Commission on Social Security Reform.⁶

The 1983 amendments produced the following changes:⁷

- (1) Mandatory coverage was extended to all newly hired federal employees and employees of nonprofit organizations.
- (2) The cost-of-living adjustment (COLA) was delayed for six months. Also, a provision was introduced that based the COLA on the lower of wage increases or consumer prices when the trust fund is low.
- (3) A phased-in increase in the normal retirement age was enacted.
- (4) Scheduled increases in the Old-Age and Survivors and Disability Insurance (OASDI) payroll tax rate were accelerated.
- (5) Payroll taxes were raised for self-employed individuals with a partial offset in the form of a tax credit.
- (6) A portion of OASDI benefits became subject to income taxes with such taxes returned to the trust fund.

These amendments increased the balance in the OASDI trust funds almost immediately. Despite the magnitude of this legislation and its surplus-generating effects, however, the public apparently remains unconvinced about Social Security's long-run viability.⁸

THE 1990 SOCIAL SECURITY REPORTS

Each of the Social Security trust funds is governed by a Board of Trustees, which is required to submit an annual report to Congress. Though the Old-Age and Survivors Insurance (OASI) Trust Fund and the Disability Insurance (DI) Fund are separate, one report covers both funds; a separate report is prepared for the Hospital

Insurance (HI) Fund. These documents report the status of the trust funds only; they make no recommendations for legislation.⁹

Terms and Procedures

These reports summarize recent developments in the trust funds' financial operations and, more importantly, assess the funds' actuarial status. This assessment is made by developing various assumptions about economic growth, productivity, inflation, unemployment and demographics (fertility, mortality and immigration), then examining the program's projected income and outgo. These projections provide the basis for assessing both the short-run and long-run status of the funds.

The short-run assessment focuses on the adequacy of reserves to pay benefits for the next five years. The principal measure used to assess the short-run "liquidity" of the fund is the contingency fund ratio. This ratio, which is defined as the amount in the trust fund at the beginning of the year divided by anticipated expenditures in that year, reflects the accumulation of interest earnings in the fund.

The long-run assessment focuses on income and outgo for a 75-year projection period. Several measures are used to assess the system's long-run "solvency." The most commonly used measure is the comparison of average annual income (excluding interest earnings on trust funds) with average annual cost, both expressed as a percent of "taxable payroll."¹⁰ The income rate is the combined payroll contribution rate as scheduled in the law plus taxation of benefits, expressed as a percentage of taxable payroll. The cost rate is the annual outgo (benefits plus administrative expense) expressed as a percentage of taxable payroll. The difference between these rates can be averaged over a period of years to determine the fund's "actuarial balance."

Another measure of actuarial balance over the long run is the present value of future income (excluding interest), outgo and taxable payroll,

⁶This is commonly referred to as "the Greenspan Commission," after Alan Greenspan, its chairman. The commission was created by President Reagan in 1981 as a response to the continuing deterioration of the OASI trust fund. Its report was published in January 1983.

⁷For further discussion, see Svahn and Ross (1983) and Myers (1985), pp. 282-99.

⁸For a critical review of the Commission's report, see Robertson (1985).

⁹This is left to the Advisory Council on Social Security, which is appointed every four years.

¹⁰"Taxable payroll" is defined as the earnings on which employees, employers and self-employed persons make contributions to the OASDI program.

Table 1

Demographic Assumptions (Ultimate Values): 1990 Social Security Reports

Demographic measure	1989	Optimistic assumption Alternative I	Intermediate assumption Alternatives II-A & II-B	Pessimistic assumption Alternative III
Fertility rate (lifetime births per 1,000 women)	1,930	2,200	1,900	1,600
Mortality rate (life expectancy at birth in years)	75.1	77.8	80.6	84.4
Annual net immigration (thousands of persons)	585	750	600	450

which includes the trust fund balance at the beginning of the period. This measure was introduced in 1988. For the OASDI funds, a long-range (75-year) income rate between 95 percent and 105 percent of the long-range cost rate traditionally indicates the program is adequately financed.

A series of projected contingency fund ratios also can be calculated over a long-run period. If a trust fund becomes depleted during the projection period, the year in which this occurs provides a summary measure of the financial condition of the fund.

Assumptions

Projections of Social Security's future income and outgo reflect a host of assumptions about economic conditions and demographic factors.¹¹ The factors influencing income are those that affect the size and composition of the working population and the general level of earnings. The factors influencing outgo are those that affect the size and composition of the beneficiary population and the general level of benefits.

In its annual Social Security reports, the Board of Trustees presents four sets of economic and demographic assumptions. Alternative I presents the most optimistic outlook, including the fastest economic growth and the lowest inflation. Alternatives II-A and II-B are intermediate ones that share the same demographic assumptions; II-A has faster growth and lower inflation than II-B. Alternative III provides the most pessimistic outlook, with the slowest growth, highest infla-

tion and least favorable demographic assumptions. The Board of Trustees typically focuses on alternative II-B.

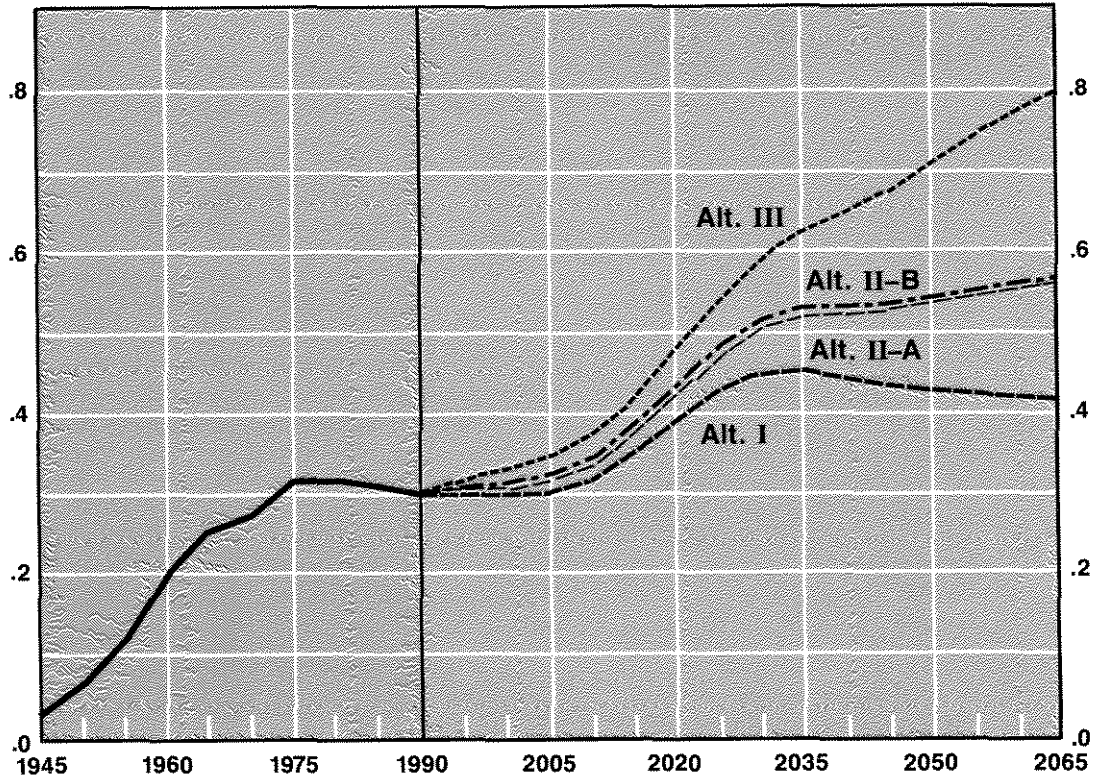
Whether a variable is classified as part of the optimistic or pessimistic alternatives depends solely on its effect on the Social Security system. For example, the highest death rate (and, thus, shortest life expectancy) appears in the optimistic alternative. For the economic factors, the optimistic case assumes the fastest real growth and the lowest inflation rate. These projections "are intended to be indicators of the trend and range of future income and outgo, under a variety of plausible economic and demographic conditions."¹² The analysis is intended to present a range of possible outcomes, rather than make an exact prediction.

Demographic Assumptions—The key demographic factors used to derive these projections are the fertility rate, the death rate and net immigration. Table 1 summarizes the assumptions contained in the 1990 Social Security reports. The optimistic alternative contains a combination of demographic factors, each of which has the effect of raising the proportion of workers to beneficiaries. The pessimistic alternative reflects just the opposite: a combination of factors, each of which lowers the worker-beneficiary ratio. The demographic assumptions for the intermediate alternatives are about halfway between these two. Each variable reaches its ultimate value at different times: the fertility rate reaches its ultimate value in 2015; life expectancy changes slowly reaching this value in

¹¹See Myers (1985), pp. 387-90.

¹²Board of Trustees, Federal Old-Age (1990), p. 33.

Figure 1
Ratio of OASDI Beneficiaries to Covered
Employment



2065; the immigration numbers presumably apply beginning in 1995.¹³

Figure 1 summarizes the beneficiary-worker ratio implied by these demographic assumptions. Alternative III, the pessimistic projection, shows a generally rapid rise in the ratio throughout the projection period. The intermediate projections indicate that the problems inherent in a rising ratio will be most serious from about 2010 to 2030. This corresponds "roughly" to the period dated 65 years from the beginning and end of the baby boom—1946-64. The optimistic projection shows an increase from 2010 to 2030, then a slight decline from 2030 to 2065.

Economic Assumptions—The key economic assumptions are summarized in table 2. The optimistic alternative includes the most favorable of each economic assumption, in combination

with the most favorable of demographic assumptions. In other words, it includes the fastest GNP growth, the lowest inflation, the lowest unemployment rate and the fastest growth in real wages. The pessimistic alternative reflects recurring business cycles and generally weak growth with high inflation. Of the two intermediate projections, A reflects more favorable economic assumptions than B.

The key economic assumption is the relationship between wages and prices, that is, the growth in real wages. This measure captures two important facets of the Social Security system: the nominal wage is the basis for estimating Social Security income, and, with benefits tied to movements in the price level, projected consumer price index (CPI) movements provide an indication of changes in Social Security costs.

¹³The Social Security reports assume that most variables level off at a constant rate after an initial adjustment

period. This constant rate is termed the ultimate value (or level).

Table 2

Economic Assumptions (Ultimate Values): 1990 Social Security Reports

Indicator	1948-1989	Optimistic Alternative I	Intermediate		Pessimistic Alternative III
			Alternative II-A	Alternative II-B	
Real GNP growth rate	3.3%	2.7%	1.8%	1.5%	0.5%
Average wage growth rate	5.3	4.2	4.7	5.3	5.8
CPI-W rate of change	4.0	2.0	3.0	4.0	5.0
Real wage growth rate	1.2	2.2	1.7	1.3	0.8
Unemployment rate	5.6	5.0	5.5	6.0	7.0
Labor force growth rate	1.6	0.5	0.0	0.0	-0.6

The Board of Trustees, Federal Old-Age (1990) report indicates that Social Security income, expressed as a percent of taxable payroll, is little affected by different assumptions about the growth of real wages. With the maximum amount of earnings that are taxable tied automatically to the increase in average wages, the income rate is essentially the OASDI contribution rate scheduled in the law.¹⁴

Social Security outgo relative to taxable payroll, however, is sensitive to the growth of real wages. In particular, an increase in the real wage decreases benefit costs as a percent of taxable payroll. For example, if wages increase faster, while inflation is unchanged, taxable payroll will increase with little change in benefit costs.¹⁵

Status of the Trust Funds

OASDI—The status of the OASI fund and the DI funds are presented both separately and together in the Board of Trustees, Federal Old-Age report. For purposes of this summary, only the combined status is presented.

Figure 2 shows the contingency fund ratio for the OASDI funds, both historically and for the four alternative sets of projections through 2065. The Board is required to assess the short-run status (the next five years) of the trust funds. It

is clear from the figure that the funds are liquid for this horizon. Even under the most pessimistic alternative, the funds are not depleted until 2023. For the immediate future (until almost 2010), the number of OASDI beneficiaries relative to the number of covered workers does not rise sharply (see figure 1). Thus, the current schedule for the payroll tax indicates rising trust fund balances until the 2010s, regardless of which set of projections is used.

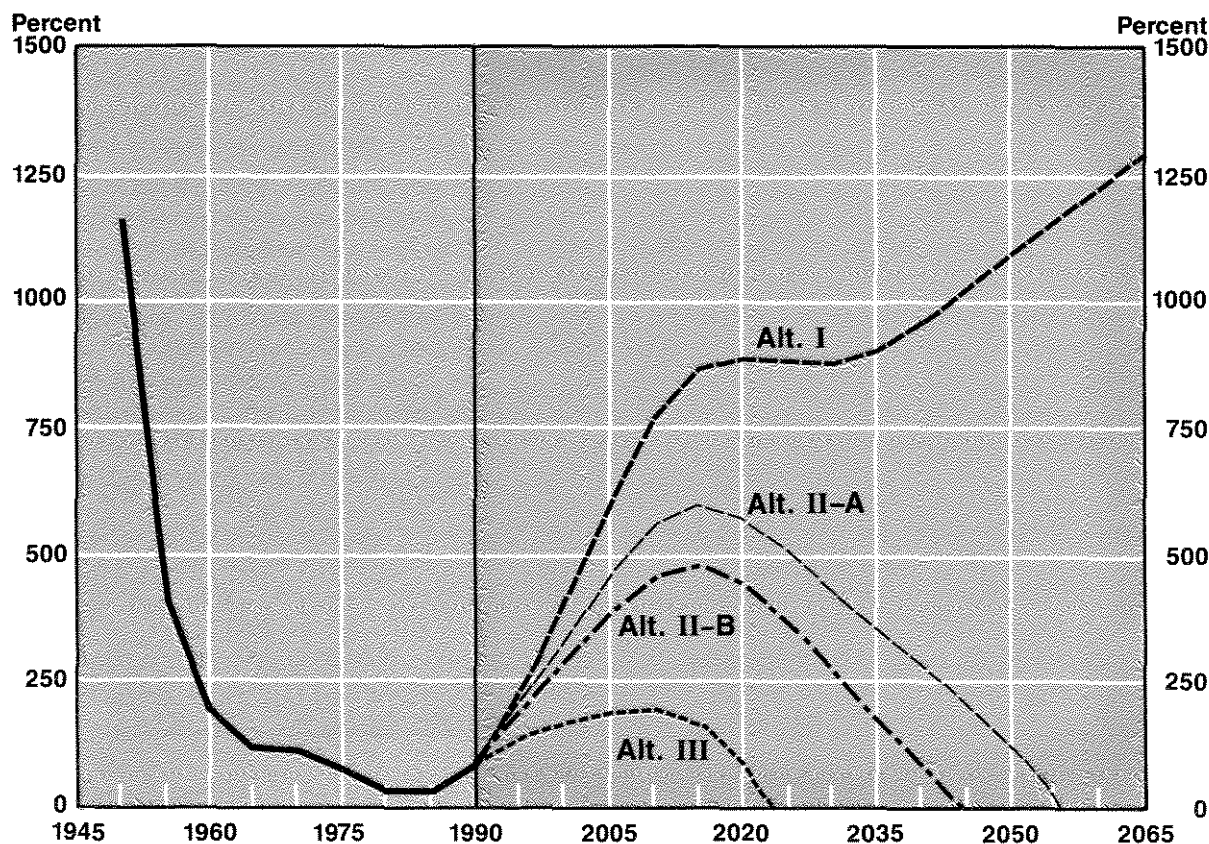
For the long run, however, conclusions about the viability of the funds vary, depending on the set of assumptions. According to figure 2, without further legislation, the funds will be depleted somewhere between 2023 and 2056, unless the optimistic economic-demographic projections occur.

Figure 3 shows another method that the Board uses to determine the actuarial status of the trust funds. It is a chart of the income rates and cost rates (both expressed as a percentage of taxable payroll). The income rates exclude interest income on assets and are essentially the same for each set of assumptions, varying only to the extent that taxation of benefits varies with the assumptions. The projected departure from past patterns shown in figure 3 is quite dramatic. The variation in the annual surplus or deficit relative to taxable payroll is very small

¹⁴There is a slight effect reflecting credit for income taxes attributable to partial taxation of benefits. Because the income thresholds are constant according to present law, the credits to the trust funds will be a smaller proportion of taxable payroll for the more optimistic projections.

¹⁵With the denominator increasing faster than the numerator, the ratio falls. See Board of Trustees, Federal Old-Age (1990), p. 106.

Figure 2
Contingency Fund Ratios for OASDI



from 1940 to 1985 compared with what is scheduled to come. The years in which the programs start running a deficit occur somewhat earlier than when the trust funds are depleted (see figure 2).

III—The Board of Trustees, Federal Hospital (1990) report indicates that, even though it is currently in surplus and will continue so for a few years, the fund will be depleted by about 2005 under the intermediate assumptions.¹⁶ With the pessimistic set of assumptions, the report indicates the fund will be depleted by 1999; under the optimistic assumptions it will be depleted by 2018.

Figure 4 shows the long-term projections of income and outgo for the hospital insurance fund until 2060. This figure shows that the surpluses currently being experienced are likely

to be short-lived. The switch to growing deficits will occur even before the number of beneficiaries for the OASDI system increases, primarily reflecting a much faster rise in the cost of hospital care per beneficiary than the rise in taxable earnings.

The Board of Trustees of the HI fund reports that

[n]ot only are the anticipated reserves and financing of the HI program inadequate to offset this demographic change [the decline in covered workers per HI enrollee], but under all but the most optimistic assumptions, the trust fund is projected to become exhausted even before the major demographic shift begins to occur.

The Board, therefore, urges that the Congress take early remedial measures to bring future HI program costs and financing into balance, and to

¹⁶Board of Trustees, Federal Hospital (1990). This report was prepared before legislation was recently enacted increasing the maximum for earnings taxable under

Medicare, Part A, to \$125,000. In addition, the deductible for hospital insurance was raised.

Figure 3
OASDI Income and Outgo Relative to Taxable Payroll

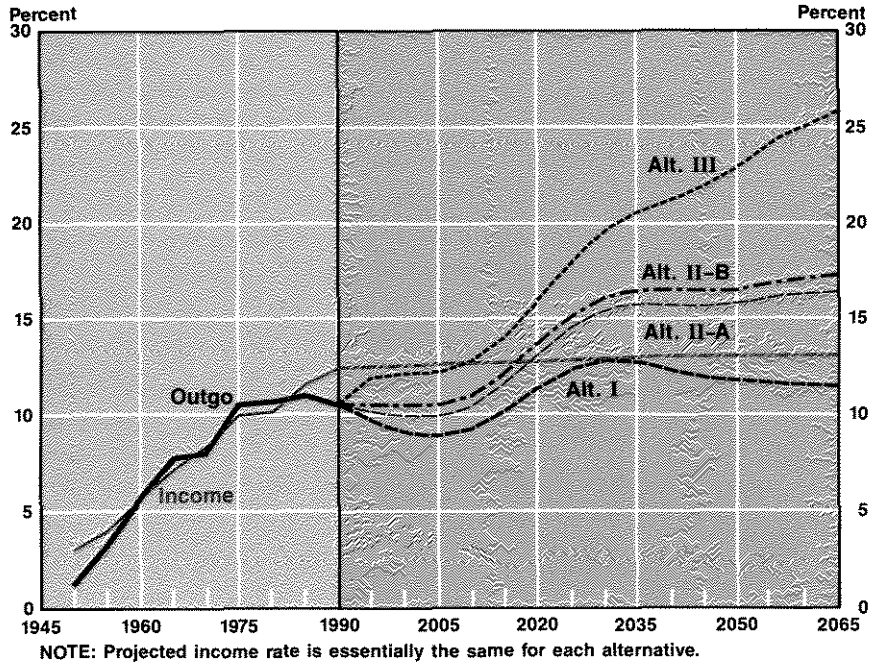


Figure 4
Hospital Insurance Income and Outgo Relative to Taxable Payroll

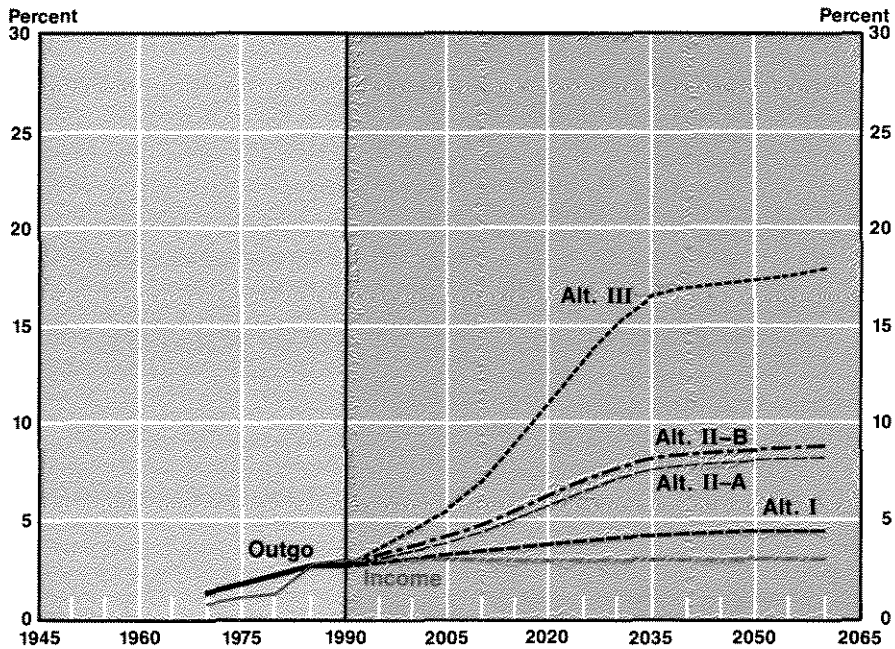


Table 3

Year in Which OASDI Trust Funds Are Estimated to be Depleted

Alternative	1990 Report			1983 Report			1982 Report		
	OASI	DI	Total	OASI	DI	Total	OASI	DI	Total
I	NA	NA	NA	NA	NA	NA	1983	NA	1983
II-A	2060	2025	2056	NA	NA	NA	1983	NA	1983
II-B	2046	2020	2043	NA	NA	NA	1983	NA	1983
III	2027	1998	2023	2028	2021	2027	1983	NA	1983

"NA" indicates that the fund is *not* estimated to be depleted during the projection period.

maintain an adequate trust fund against contingencies.¹⁷

1990 REPORT COMPARED WITH 1983 REPORT

The 1983 amendments supposedly put the Social Security system on firm financial ground. As noted above, the amendments affected mainly the OASDI program rather than Medicare. Has there been any erosion in this footing since 1983? If so, why?

Status of the Trust Funds

OASDI—Table 3 compares the most recent report of the status of the OASDI funds from the Board of Trustees, Federal Old-Age (1990) with those from 1982 and 1983. The 1983 amendments were a response to the short-run crisis facing the system at that time. A comparison of the 1982 and 1983 reports indicates that the amendments appeared to put the system on sound financial footing. As the 1990 column in table 3 indicates, however, substantial deterioration has occurred since 1983. On a combined basis, the trust funds are projected to be depleted during the projection period for all alternatives except the most optimistic, Alternative I. The seriousness of this projection change is difficult to discern; the direction of movement, however, is cause for concern.

HI—Comparing the status of the HI trust fund in 1990 with that of 1983 indicates that not all surprises are bad news. In its 1983 report, the Board concluded that

[t]ax rates currently specified in the law . . . are sufficient, along with interest earnings and assets in the fund, to support program expenditures only over the next six to seven years.¹⁸

More specifically, the fund was projected to be depleted by no later than 1996 with the optimistic projections, by either 1990 or 1991 with the intermediate assumptions and as early as 1988 with the pessimistic projections. Clearly, these projections were wrong, chiefly because of errors in projecting the costs of the program.¹⁹ The schedule of tax rates in effect in 1983 was not changed as of 1990. The 1990 report indicates that the fund will be depleted as early as 1999 and as late as 2019.

A Review of the 1983-89 Experience

Despite the gloomier outlook suggested in table 3, the trust funds' experience since 1983 has been more favorable than was projected in 1983. Table 4 shows the status of the funds in the 1980s and the 1983 alternative projections. While the OASDI trust fund balance moved quite closely with the optimistic set of projections, the health insurance fund balance far exceeded the most optimistic projections. These

¹⁷Board of Trustees, Federal Hospital (1990), pp. 11-12.

¹⁸Board of Trustees, Federal Hospital (1983), p. 49.

¹⁹For a summary of the changes in the provisions in the administration of Medicare, Part A, see *Social Security Bulletin* (1989), pp. 54-55.

Table 4
Status of Social Security Trust Funds—1983-89: Actual vs. Projected (billions of dollars)

	1983	1984	1985	1986	1987	1988	1989
OASDI FUND							
Actual	\$24.9	\$31.1	\$42.2	\$46.9	\$68.8	\$109.8	\$163.0
1983 projections							
Alternative I	27.9	30.2	39.6	46.2	67.4	111.4	170.2
Alternative II-A	27.6	28.8	35.6	39.5	45.3	76.8	117.6
Alternative II-B	27.5	27.6	32.5	36.1	39.7	53.9	82.4
Alternative III	26.2	21.9	24.2	32.2	27.2	51.1	80.0
HEALTH INSURANCE FUND							
Actual	12.9	15.7	20.5	40.0	53.7	69.6	85.6
1983 projections							
Alternative I	11.8	12.6	15.2	27.6	31.4	33.5	34.6
Alternative II-A	11.7	11.6	11.2	17.1	23.2	20.3	14.3
Alternative II-B	11.7	11.2	10.2	11.8	12.6	16.1	7.8
Alternative III	11.4	9.1	5.5	1.8	6.3	—	—

outcomes suggest that there is much greater uncertainty connected with the health insurance trust funds because of the difficulty in forecasting costs of medical care. Estimates of the viability of the health insurance trust funds have tended to be too pessimistic.

To isolate whether the 1983-89 outcome for the trust funds was attributable to demographic or economic factors, tables 5 and 6 summarize the actual experience over this period and compares it with the 1983 projections. The demographic projections were quite accurate except for net immigration, which was higher than estimated. The economic experience was generally consistent with the more optimistic projections made in 1983. The actual growth of real wages was midway between alternatives I and II-A. Given the uncertainty that prevailed in 1983 about the strength and longevity of the expansion, it is not surprising that the experience during the long expansion matches more closely the optimistic projections.

How Projections Have Changed from 1983 to 1990

The 1983 report received considerable attention because of the surpluses it projected, reflecting the 1983 amendments. For the Alternative II-B projections, the balance in the OASDI fund was projected to be nearly \$21 trillion by 2045.²⁰ In the 1990 report, the largest balance for the II-B projection is now estimated at \$9.2 trillion in 2025. Figure 5 summarizes the II-B projections for both the 1983 and the 1990 reports. The source of the revisions requires further investigation, especially since the economic-demographic experience during the 1983-89 period was more favorable than projected.

Table 7 summarizes the demographic assumptions for the 1983 and 1990 reports.²¹ The fertility rate generally has been revised downward, and projected life expectancy and net annual immigration have been revised upward. One way to summarize these demographic effects is

²⁰In 1983, the HI funds were projected for only 25 years and were projected to deplete quickly.

²¹The numbers in this table are values for the last year of the projection period—2060 for the 1983 report and 2065

for the 1990 report. These are to be distinguished from the numbers in table 5 which were averages for the 1983-89 period from the 1983 report.

Table 5

Accuracy of 1983 Demographic Assumptions for 1983-89 Period

Demographic measure	Actual	Alternative I	Alternative II-A	Alternative II-B	Alternative III
Fertility rate (lifetime births per 1,000 women)	1,860	1,940	1,880	1,880	1,800
Mortality rate (life expectancy at birth in years)	74.8	74.6	75.3	75.3	76.0
Net annual immigration (thousands of persons)	612	450	400	400	350

Table 6

Accuracy of 1983 Economic Assumptions for 1983-89 Period

Indicator	Actual	Alternative I	Alternative II-A	Alternative II-B	Alternative III
Real GNP growth rate	3.9%	4.6%	4.0%	3.2%	2.5%
Annual wage growth rate	5.3	5.2	5.0	5.3	6.1
CPI-W rate of change	3.4	3.0	3.3	4.3	5.9
Real wage growth rate	1.9	2.3	1.7	1.0	0.2
Unemployment rate—end of period, 1989	5.3	5.6	5.8	6.9	7.8

to look at the projected ratio of beneficiaries to employment. Figure 6 shows that there has been a substantial upward revision in the ratio of beneficiaries to covered employment since 1983. This indicates that OASDI expenditures are revised upward relative to income. Revision of this ratio reflects mainly a downward revision of projected employment.

Table 8 shows the economic assumptions for the 1983 and 1990 reports.²² Despite an economic performance that conformed most closely with the 1983 optimistic projection, the econom-

ic projections were revised downward from 1983 to 1990. The nature of the revision can be summarized most simply by looking at the real GNP growth rate. These projections were revised downward by 0.3 percent to 0.5 percent. The ultimate unemployment rate was revised upward from 0.5 percent to 1 percent, and the growth rate of real wages was revised downward by 0.2 percent to 0.3 percent. While these differences might appear small, they have significantly different implications about the future of the Social Security system when carried through the 75-year projection period.

²²Like table 7, these ultimate values are for the last year of the projection period, and have to be distinguished from the numbers in table 6, which cover the 1983-89 period.

Figure 5
OASDI Trust Fund Balance
(Alternative II-B), 1990 vs. 1983

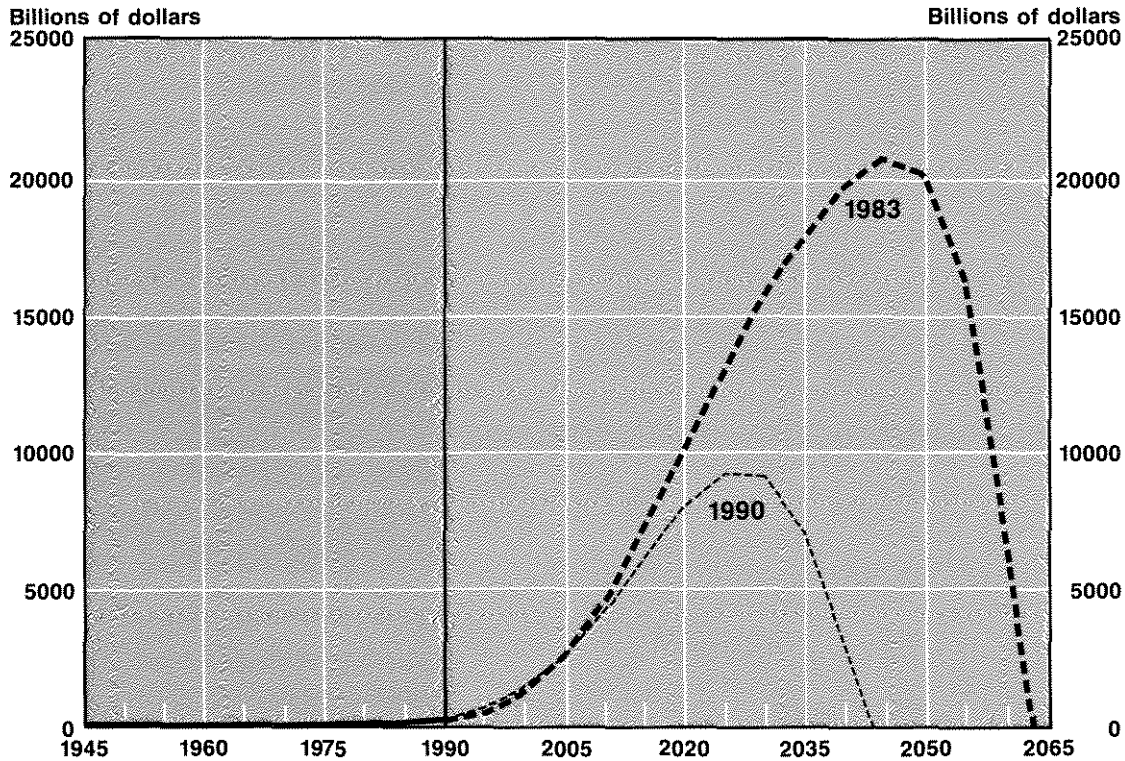


Table 7

Demographic Assumptions (Ultimate Values): 1990 vs. 1983
Social Security Reports

Demographic measure	Alternative I		Alternatives II-A and II-B		Alternative III	
	1990	1983	1990	1983	1990	1983
Fertility rate (lifetime births per 1,000 women)	2,200	2,300	1,900	2,000	1,600	1,600
Mortality rate (life expectancy at birth in years)	77.8	77.3	80.6	80.4	84.4	85.5
Annual net immigration (thousands of persons)	750	450	600	400	450	350

Figure 6
Ratio of OASDI Beneficiaries to Covered
Employment (Alternative II-B), 1990 vs. 1983

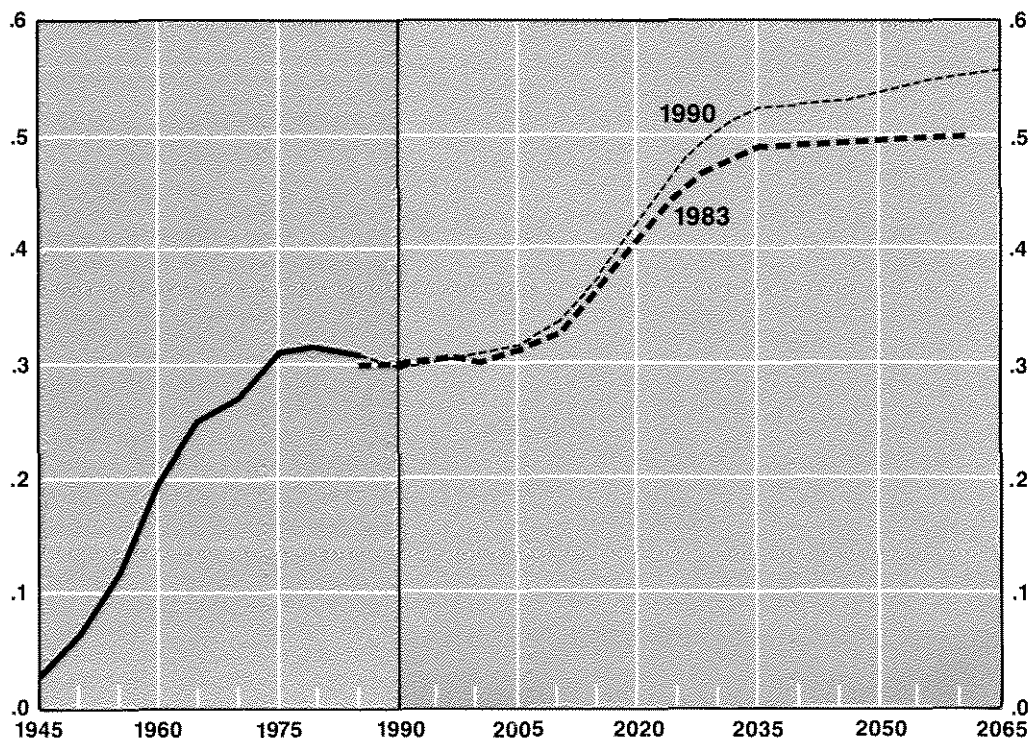


Table 8

Economic Assumptions (Ultimate Values): 1990 vs. 1983 Social Security Reports

Indicator	Alternative I		Alternative II-A		Alternative II-B		Alternative III	
	1990	1983	1990	1983	1990	1983	1990	1983
Real GNP growth rate	2.7%	3.2%	1.8%	2.3%	1.5%	1.9%	0.5%	0.8%
Average wage growth rate	4.2	4.5	4.7	5.0	5.3	5.5	5.8	6.0
CPI-W rate of change	2.0	2.0	3.0	3.0	4.0	4.0	5.0	5.0
Real wage growth rate	2.2	2.5	1.7	2.0	1.3	1.5	0.8	1.0
Unemployment rate	5.0	4.0	5.5	5.0	6.0	5.5	7.0	6.5
Labor force growth rate	0.5	0.6	0.0	0.1	0.0	0.1	-0.6	-0.6

Figure 7
OASDI Trust Fund Balance
(Alternative II-B), 1990 vs. 1983

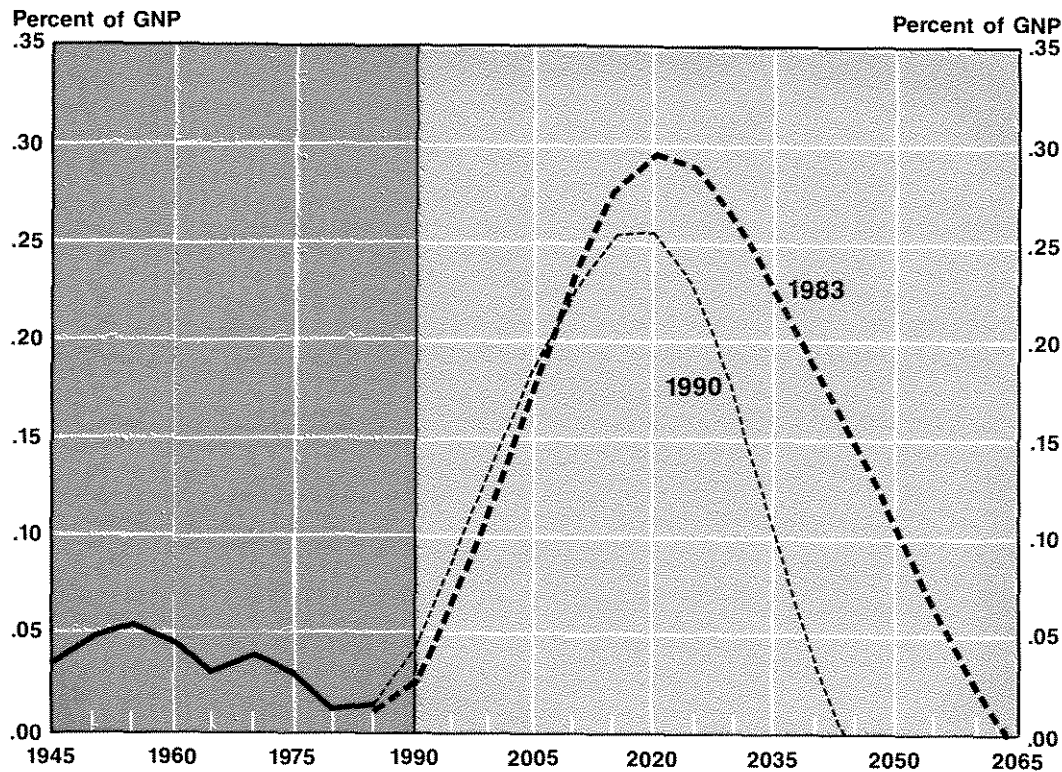


Figure 7 summarizes the trust fund balances for Alternative II-B from the two reports as a percent of GNP. Once again, the difference is striking. As a percent of GNP, the OASDI trust fund balances are now projected to be higher until 2015, before peaking at 25 percent, and then falling to zero by 2043, instead of 2063, as projected in 1983.

THE CONSISTENCY OF PROJECTION ASSUMPTIONS

The point of the alternative projections is to "present a range of generally consistent sets of economic assumptions which have been designed to encompass most of the possibilities that might be encountered."²³ The intermediate alternatives are considered the most probable.

In fact, the official statement of opinion by the chief actuary refers only to the II-B alternative.²⁴

While the projected values of the other economic variables are presumably consistent with the assumed rates of real growth, their consistency is not actually examined in these reports. In this section, we examine the projections' internal consistency by looking at trends in productivity and real wages, capital formation and immigration.

Productivity and Real Wages

Productivity growth is a key determinant of the growth in real wages.²⁵ Table 9 summarizes U.S. productivity and real wage trends since 1959. From 1959 to 1988, real earnings grew at

²³Board of Trustees, Federal Old-Age (1990), p. 35.

²⁴*Ibid.*, p. 149.

²⁵This relationship is discussed at length in U.S. Department of Health and Human Services (1988).

a 0.9 percent average annual rate, while productivity grew at a 1.6 percent rate. Most of the growth in earnings and productivity occurred before 1968. Since then, productivity has expanded at a 1.2 percent annual rate and real earnings growth has been essentially zero. While the 1970s were buffeted by supply-side shocks, the 1980s seem to have been characterized by stagnant productivity and earnings growth. Thus, in light of the experience of the last two decades, all four alternatives appear relatively optimistic.

Another way to evaluate the real wage assumption is to examine forecasts based on information contained in its own past movement. Figure 8 gives one such forecast for the 1990s.²⁶ The average rate of change for the real wage forecast for the 1989-99 period is -0.3 percent, which falls below the pessimistic alternative of 0.2 percent. Indeed, except for Alternative III, all the projections of real wage growth lie outside the forecasted 95 percent confidence bands.²⁷

Production Function Implications

Another way to evaluate these alternatives is to examine the growth in the capital stock that would be required to provide the projected GNP, given the assumption about employment growth.²⁸ Table 10 summarizes the results of these calculations and shows the 1948-89 period for comparison.

The optimistic Alternative I, with a growth rate of real GNP of 2.7 percent for the next 75 years, appears unattainable, given past U.S. experience. Based on relationships that prevailed over the last 40 years, the capital stock would have to grow 7 percent per year for the next 75 years. The fastest rate that the capital stock grew in any single year during the 1948-89 period was 5.4 percent in 1966.²⁹

The II-A alternative implies a growth of per capita GNP of 1.62 percent per year. With employment projected to grow at a 0.18 percent rate, the capital stock would have to grow at a 4.66 percent annual rate over the 75-year projection period. From 1948 to 1989, the capital stock grew that fast only four times.

²⁶This is derived by fitting a Box-Jenkins model (ARMA) to the percent change in the real wage (adjusted for trend).

²⁷If real wages continue to move as they have historically, there is a 95 percent probability that the rate of change of real wages will average between -1.6 percent and 0.9 per

Table 9
Growth Rates of Productivity and Real Wages

	Productivity	Annual real wages
Historical (1959-88)	1.6%	0.9%
1959-68	2.5	2.6
1969-78	1.4	0.1
1979-88	0.9	0.0
Projected ¹		
Alternative I	2.2	2.2
Alternative II-A	1.9	1.7
Alternative II-B	1.7	1.3
Alternative III	1.4	0.8

¹Rates of change are ultimate values.

The annual reports suggest that Alternative II-B is the "most realistic" one. As noted earlier, it is based on the same demographic assumptions as II-A, but its economic assumptions are more pessimistic. The implied growth of the capital stock of 3.12 percent seems reasonable, given the historical record.

Finally, Alternative III presumes very slow growth in the capital stock. Such a growth rate is easily achievable, given the postwar experience.

Although the alternative projections in the Social Security annual reports appear to be consistent with past experience, there is little indication of the probability that could be assigned to their occurrence. A closer analysis of these alternatives indicates that, based on historical relationships between capital, labor and output, the optimistic alternative is quite unlikely to occur. Furthermore, the intermediate II-A projection also appears overly optimistic. As a result, to assess the future of Social Security, attention should be focused on the more probable alternatives, II-B and III.

Immigration

Another way to examine the alternative assumptions is to consider to what extent immigration, rather than the capital stock, could be changed so as to achieve the different alterna-

cent during the 1989-99 period. These confidence bands are not shown on figure 8.

²⁸For a description of the methodology underlying these calculations, see Carlson (1990).

²⁹*Ibid.*, p. 11.

Figure 8
Real Wage

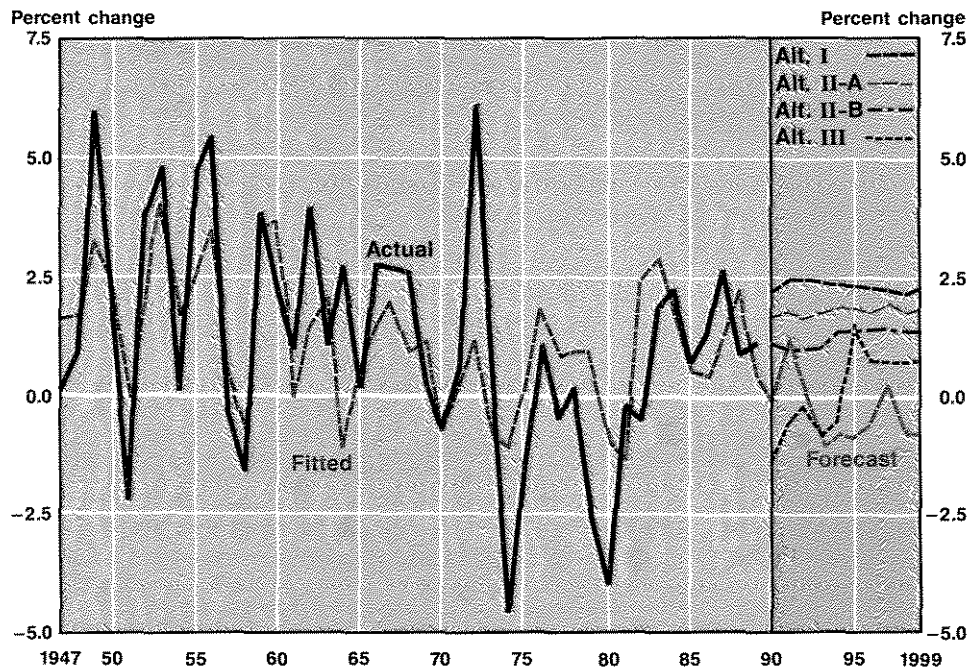


Table 10

Capital Stock Growth Required to Achieve Social Security's Projected Alternatives¹

	Historical	Projected: 1990-2065			
	1948-89	I	II-A	II-B	III
Real GNP growth	3.27%	2.68%	1.93%	1.60%	0.81%
Minus: population growth	1.30	0.58	0.31	0.31	0.05
Equals: per capita GNP growth	1.97	2.10	1.62	1.29	0.76
Or					
Real GNP growth	3.27	2.68	1.93	1.60	0.81
Technical progress	0.81	0.81	0.81	0.81	0.81
Plus: employment contribution	1.36	0.40	0.14	0.13	-0.15
Employment growth	1.72	0.50	0.18	0.17	-0.19
Times: elasticity	(0.79)	(0.79)	(0.79)	(0.79)	(0.79)
Plus: capital stock contribution	0.76	1.47	0.98	0.66	0.15
Capital stock growth	3.60	7.02	4.66	3.12	0.71
Times: elasticity	(0.21)	(0.21)	(0.21)	(0.21)	(0.21)
Minus: employment growth	1.72	0.50	0.18	0.17	-0.19
Plus: change in employment-population ratio	0.42	-0.08	-0.13	-0.14	-0.24
Employment growth	1.72	0.50	0.18	0.17	-0.19
Minus: population growth	1.30	0.58	0.31	0.31	0.05
Equals: per capita GNP growth	1.97	2.10	1.62	1.29	0.76

¹Some components do not add to total because of rounding or production function error.

tives.³⁰ Once again, the feasibility of alternatives I and II-A appears doubtful.

Real GNP growth in Alternative II-A could be achieved with a growth rate of employment of 0.46 percent per year if the capital stock grew at its 1948-89 trend rate of 3.60 percent. Based on Census Bureau estimates of the impact of immigration on total population, this employment growth could be achieved with immigration of about one million persons per year from 1990 to 2065.³¹ This is 200,000 more than the Census Bureau's high-immigration assumption.

Applying the same methodology to Alternative I indicates the limitations of immigration policy in boosting GNP growth. Achieving the 2.68 percent growth rate in real GNP would require immigration of almost four million persons per year over the 1990-2065 period.

CONCLUSION

The U.S. Social Security system was created in 1935 and has withstood 50-plus years of substantial social, economic, demographic and political change. Its evolution has not been smooth, however, and several financing crises have occurred.

Partly as a result of these periodic crises, the American public has become increasingly skeptical about Social Security's future. This skepticism reflects primarily concern about the financing of the retirement and medical needs of the baby-boom generation, those persons born between 1946 and 1964. Coupled with a low birth rate in the 1970s and 1980s, the evolving demographics indicate a sharp drop in the labor force relative to the total population beginning in about 2010-15.

One of the most important pieces of Social Security legislation was the amendments of 1983, which resulted from the recommendations of the National Commission on Social Security Reform. As a result of these amendments, the system, many thought, was placed on a sound financial footing. By accelerating the scheduled increase in payroll taxes and designing a plan of phasing in increases in retirement age, the amendments were intended to expand the system's trust funds sharply in the 1990s and early 2000s, thereby easing the burden on

future workers of providing for the needs of the retiring baby-boom generation.

This article focused on the 1990 annual reports of the Social Security trust funds to determine if the status of those funds has changed since 1983. It showed that the projected surpluses are now smaller than initially forecast, even though the 1983-89 economic experience was more favorable than had been expected.

The OASDI fund is not in short-run danger of being depleted; however, it is now projected to be depleted in 2043. Moreover, the hospital insurance fund is headed for depletion in 2003. These dates of depletion are based on the intermediate II-B projection, which the system's Board of Trustees considers the most probable. In addition, the system's own actuary concludes that the trust funds, based on its own guidelines, are not actuarially sound.

A review of the assumptions that underlie this revised outlook showed that the downward revisions chiefly reflected forecasts of slower real economic growth. The financial condition of the Social Security system is affected particularly by a downward revision in real wage and productivity growth.

Using production function relationships derived from the 1948-89 experience, an analysis of the projections presented in the 1990 Social Security report indicated that attention is properly focused on the II-B assumptions. Recent economic experience suggests, however, that the pessimistic projections cannot be ignored. An examination of immigration possibilities and a time series analysis of real wages also suggested that pessimistic alternatives II-B and III are more likely to occur than alternatives I and II-A, which are more optimistic. Recent productivity trends suggest that the near-term Social Security surpluses will be smaller than generally expected and the far-term deficits will be much larger.

The key role of economic assumptions in projecting income and outgo for the Social Security system suggests that the nation's macroeconomic policy is vital to its long-run viability, especially to the extent that such policy can influence long-term growth. The country's underlying demographics have set the stage for potential

³⁰For an extensive discussion of the economic effects of immigration, see Simon (1989).

³¹Bureau of the Census (1989).

problems in the 21st century; barring further major changes in immigration policy, there is little that can be done to alter these trends.³²

The future of Social Security is clouded by the changing demographics. While Social Security trust funds are currently in surplus and balances are building, projections of future surpluses are being revised downward. Nonetheless, these surpluses are projected to continue for the next 20-25 years. Looking 75 years into the future, however, these surpluses, even if realized, would be relatively short-lived.

REFERENCES

- The Board of Trustees, Federal Hospital Insurance Trust Fund. *1990 Annual Report* (Social Security Administration, 1990).
- _____. *1983 Annual Report* (Social Security Administration, 1983).
- The Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds. *1990 Annual Report* (Social Security Administration, 1990).
- _____. *1983 Annual Report* (Social Security Administration, 1983).
- Bureau of the Census, U.S. Department of Commerce. *Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080* (GPO, January 1989).
- Carlson, Keith M. "On Maintaining a Rising U.S. Standard of Living Into the Mid-21st Century," this *Review* (March/April 1990), pp. 3-16.
- Halter, William A., and Richard Hemming. "The Impact of Demographic Change on Social Security Financing," *International Monetary Fund Staff Papers* (September 1987), pp. 471-502.
- Myers, Robert J. *Social Security*, 3rd ed. (Irwin Inc., 1985).
- Office of Management and Budget. *Budget of the United States Government FY 1985* (GPO, 1984).
- Rasmussen, Scott W. "A Political Coward's Guide to Social Security Reform," *Wall Street Journal*, February 22, 1990.
- Report of the National Commission on Social Security Reform (GPO, January 1983).
- Robertson, A. Haeworth. "The National Commission's Failure to Achieve Real Reform," in Peter J. Ferrara (ed.), *Social Security: Prospects for Real Reform* (Cato Institute, 1985), pp. 37-58.
- Simon, Julian L. *The Economic Consequences of Immigration* (Basil Blackwell published in association with Cato Institute, 1989).
- Svahn, John A., and Mary Ross. "Social Security Amendments of 1983: Legislative History and Summary of Provisions," *Social Security Bulletin* (July 1983), pp. 3-48.
- U.S. Department of Health and Human Services, Social Security Administration. *Economic Projections for OASDI Cost and Income Estimates: 1987, Actuarial Study No. 101* (Social Security Administration, May 1988).
- _____. *Social Security Bulletin, Annual Statistical Supplement*, 1989 (GPO, 1989).

³²The recently enacted immigration law is expected to increase the immigration rate to almost 700,000 persons per year when fully effective in 1995.