
Actuarial Status of the Old-Age and Survivors Insurance and Disability Insurance Trust Funds

by Harry C. Ballantyne*

The 1982 Annual Report of the Board of Trustees of the Old-Age and Survivors Insurance (OASI) and Disability Insurance (DI) Trust Funds indicates severe financial problems in both the short and the long range. The short-range financial status is significantly worse than was estimated last year, after enactment of the 1981 legislation, because of continuing unfavorable economic conditions. The estimated long-range deficit is the same as the deficit that was estimated last year before the 1981 legislation and is therefore somewhat worse than was estimated immediately after enactment of the legislation. Under present law, which authorizes temporary interfund borrowing among the OASI, DI, and Hospital Insurance (HI) Trust Funds, the OASI Trust Fund would become unable to pay benefits on time by July 1983. The assets of the DI Trust Fund, on the other hand, are expected to grow rapidly in both the short and long range. If the assets of both the OASI and DI Trust Funds were combined, however, the two funds would still become unable to pay benefits on time by the latter half of 1983, based on all four sets of economic and demographic assumptions in the 1982 report. Even if the temporary interfund borrowing authority in present law were extended, the combined assets of the OASI, DI, and HI Trust Funds would become insufficient to pay benefits on time by 1984, based on the two less favorable sets of assumptions in the 1982 report. Based on the other two, more favorable, sets of assumptions, the three combined funds could pay benefits on time through the 1980's, but there would be little or no margin of safety to permit timely payment of benefits if economic conditions are even slightly less favorable.

This article discusses the current financial and actuarial status of the Old-Age and Survivors Insurance (OASI) and Disability Insurance (DI) Trust Funds, based on the 1982 trustees report for these funds¹ and on the calculations underlying this report. Because of the new interfund borrowing provisions (discussed on page 6), some aspects of the Hospital Insurance (HI) Trust Fund are also discussed. All figures are on a calendar year basis and are for the OASDI program as it is now structured in the present law.

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¹ 1982 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds, April 1, 1982.

Table 1 shows the payroll tax rates for employers and employees as established by law. Taxes at these rates are paid on each worker's earnings up to \$32,400 in 1982. In future years, the Social Security earnings base will rise as average wages increase. For the self-employed, the OASDI tax rates are about 1 1/2 times the rates for employees, and the HI tax rates are the same as for employees.

It is intended that the income for each program will closely match outgo in most years. When income exceeds outgo, the excess serves to increase the trust funds. When outgo exceeds income, the trust funds are drawn down. Thus, the trust funds serve as a contingency reserve to absorb temporary fluctuations in income

Table 1.—Payroll tax schedule: Contribution rates payable by employer and employee (each)

[Percent of taxable earnings]

Calendar year	OASDI			HI	Total
	OASI	DI	Total		
1981.....	4.70	0.65	5.35	1.30	6.65
1982-84.....	4.575	.825	5.4	1.30	6.70
1985.....	4.75	.95	5.7	1.35	7.05
1986-89.....	4.75	.95	5.7	1.45	7.15
1990 and later ...	5.10	1.10	6.2	1.45	7.65

and outgo. The trust funds are invested in U.S. Government bonds, notes, and other securities that bear interest rates similar to those for long-term securities issued to the general public.

Current Status

During 1981, 116 million workers contributed to the OASDI and HI programs through payroll taxes. At the end of 1981, approximately 36 million OASDI beneficiaries were receiving monthly benefit payments.

Table 2 presents a summary of the recent financial operations for the OASDI program. Included are the cash income, outgo, and changes in assets that occurred during 1980 and 1981. In 1981, income to the OASDI Trust Funds was \$142.4 billion and outgo was \$144.4 billion. As a result, the OASDI Trust Funds dropped by \$1.9 billion. Administrative expenses represented about 1.2 percent of benefit payments for OASDI. The 1980 figure was 1.3 percent.

Table 3, which summarizes operations of the OASDI Trust Funds over the past 11 years, shows that 1981 was the seventh consecutive year that the combined OASDI funds decreased, after they had reached a high point of \$45.6 billion at the end of 1974. These decreases have occurred despite a series of amendments to the Social Security Act, beginning in 1977, aimed at strengthening the program's short-range financing.

The Social Security Act was most recently amended in 1981 to reduce the projected costs of the program and to allow temporary interfund borrowing. Such borrowing permits loans among the OASI, DI, and HI funds, at the discretion of the Managing Trustee. Interfund borrowing may not be done after December 31, 1982, however, and may not go beyond the levels needed to assure the timely payment of benefits for the first 6 months of 1983.

Because of short- and long-range financial problems, the President established the National Commission on Social Security Reform in December 1981. The Commission is charged with reviewing the current and long-term financial condition of Social Security. In a report due December 31, 1982, the Commission is to provide appropriate recommendations to the Secretary of

Table 2.—Financial operations of the OASDI Trust Funds during calendar years 1980 and 1981

[In billions]

Item	1981 OASDI			1980 OASDI Total
	OASI	DI	Total	
Assets at beginning of year	\$22.8	\$3.6	\$26.5	\$30.3
Income in year, total	125.4	17.1	142.4	119.7
Tax contributions	122.6	16.7	139.4	116.7
Interest	2.1	0.2	2.2	2.3
General Fund of Treasury	0.7	0.2	0.8	0.7
Outgo in year, total	126.7	17.7	144.4	123.6
Benefit payments ¹	123.8	17.2	141.0	120.6
Administrative expenses	1.3	0.4	1.7	1.5
Transfers to Railroad Retirement account	1.6	(2)	1.6	1.4
Net change in assets	-1.3	-0.6	-1.9	-3.8
Assets at end of year	21.5	3.0	24.5	26.5

¹ Includes cost of rehabilitation.

² Less than \$0.05 billion.

Note: Components may not add to totals due to rounding.

Health and Human Services, the President, and the Congress on long-term reforms to put Social Security back on a sound financial footing.

Actuarial Cost Projections

As required by law, the annual trustees reports contain projections of each fund's estimated financial operations and status. For the OASDI program, these estimates extend over the next 75 years. The projected costs after the first few years are presented as percentages of taxable payroll. Such projections allow expenditures to be compared directly with payroll tax rates. Since precise prediction of the future is not possible—even in the short range—both short- and long-range estimates are made using various sets of reasonable assumptions to indicate the trend and general range of future costs.

Table 3.—Combined OASI and DI Trust Fund operations, calendar years 1970-81

[Amounts in billions]

Calendar Year	Income	Outgo	Increase in funds	Assets at end of year	Assets at beginning of year as a percentage of outgo during year
1970	\$37.0	\$33.1	\$3.9	\$38.1	103
1971	40.9	38.5	2.4	40.1	99
1972	45.6	43.3	2.3	42.8	93
1973	54.8	53.1	1.6	44.4	80
1974	62.1	60.6	1.5	45.6	73
1975	67.6	69.2	-1.5	44.3	66
1976	75.0	78.2	-3.2	41.1	57
1977	82.0	87.3	-5.3	35.9	47
1978	91.9	96.0	-4.1	31.7	37
1979	105.9	107.3	-1.5	30.3	30
1980	119.7	123.6	-3.8	26.5	25
1981	142.4	144.4	-1.9	24.5	18

Note: Components may not add to totals due to rounding.

Assumptions Used

Future OASDI income and outgo will depend on mortality, fertility, unemployment, inflation, and other economic and demographic factors. This year's projections were prepared using four different sets of assumptions regarding these economic and demographic factors.

"Alternative I" reflects a relatively optimistic view of the external factors that determine Social Security costs. "Alternative II-A" assumes future economic performance consistent with the President's 1983 Budget assumptions; "Alternative II-B" assumes lower economic growth. "Alternative III" reflects a more pessimistic view of the factors that will determine Social Security costs. Table 4 shows selected values of several of the assumptions used in the four basic projections and describes these assumptions more fully. There is no assurance that experience will actually fall within the

Table 4.—Economic and demographic assumptions used to determine the four alternatives

Calendar year	Percentage increase over previous year in average annual—			Average annual unemployment rate	Total fertility rate ²
	Real GNP ¹	Wages in covered employment	Consumer Price Index		
Alternative I assumptions					
1982	1.1	8.2	6.3	8.6	1.9
1985	5.1	7.0	4.2	5.8	2.0
1995	3.4	4.5	2.0	4.0	2.2
2005 and later	3.4	4.5	2.0	4.0	2.4
Alternative II-A assumptions ³					
1982	0.3	8.6	6.8	8.9	1.9
1985	4.8	7.4	4.8	6.4	1.9
1995	3.0	5.0	3.0	5.0	2.0
2005 and later	2.9	5.0	3.0	5.0	2.1
Alternative II-B assumptions					
1982	-0.8	6.6	6.9	9.1	1.9
1985	3.0	6.9	6.6	7.7	1.9
1995	2.5	5.5	4.0	5.0	2.0
2005 and later	2.5	5.5	4.0	5.0	2.1
Alternative III assumptions					
1982	-1.5	6.3	7.2	9.3	1.8
1985	3.8	9.2	9.2	8.8	1.8
1995	1.8	6.2	5.2	6.0	1.8
2005 and later	2.0	6.0	5.0	6.0	1.7

¹ Gross national product (GNP—the total output of goods and services) expressed in constant dollars. The percentage increase in real GNP is assumed to change after the year 2005. The values for the year 2060 are 3.4, 2.5, 2.1, and 1.0 percent for the Alternative I, II-A, II-B, and III assumptions, respectively.

² The number of children who would be born to a woman in her lifetime based on the birth rates at each age in the year shown.

³ Alternative II-A uses the economic assumptions underlying the President's 1983 Budget, adjusted to reflect more recent data available on wages and prices.

range of any of these assumptions. However, it is not considered likely that actual experience will lie outside the range of the assumptions.

Measures of Actuarial Status

In analyzing the financial status of the program, several measures of actuarial status are commonly used. This terminology is defined below.

Fund ratio. The amount in the trust fund at the beginning of a year, expressed as a percentage of that year's expenditures, is the "fund ratio." For example, a fund ratio of 25 percent means that the amount in the fund at the beginning of a year is one-fourth of the outgo during the year (or enough to pay benefits for about 3 months in the absence of any income). At the beginning of 1982, the fund ratios for OASI, DI, and the two funds combined, were 15 percent, 16 percent, and 15 percent, respectively. Of course the ratio for any year can only be estimated before the year is completed and the amount of expenditures is known. Several factors should be considered in determining appropriate fund ratios:

- (1) OASI and DI benefits are paid out early each month, but the income from payroll taxes is spread over the entire month. If the OASI or DI Trust Fund were to drop below the amount needed at the beginning of a month to pay benefits, the benefit checks could not be sent out in a timely manner. A fund ratio as low as 8 percent would usually imply inability to pay all benefits on time. In practice, a fund ratio of about 12-14 percent would mean that this point is near and that action may be needed very soon to strengthen the financing. And, to assure payment of benefits in the short range, substantially higher fund ratios would be needed.
- (2) Payroll-tax receipts to the trust funds also fluctuate during the year (as do other items of income and outgo).
- (3) Unforeseen changes in the economy may cause the trust funds to decrease unexpectedly. Each trust fund should have sufficient assets to avoid the need for hasty action to assure the payment of benefits.

Cost rate. The annual outgo or disbursements, expressed as a percentage of taxable payroll, is the "cost rate." The year-by-year cost rates can be used to establish tax-rate schedules that approximately support pay-as-you-go financing, taking into account interest income and the need to have adequate fund reserves.

Actuarial balance. The average difference between the scheduled tax rate (for employer and employee combined) and the cost rate, over a given period of time, is the "actuarial balance." The actuarial balance is the

usual measure of financial status over periods of 25 years or more. The OASDI system is said to be in *close actuarial balance* over the long range if the average scheduled tax rates are 95-105 percent of the cost rates. The actuarial balance may show either a surplus or a deficit. For example, if the 75-year OASDI cost rate were 14 percent of payroll, and the average OASDI tax rate were 12 percent of payroll, there would be an actuarial deficit of 2 percent of payroll, and the system would not be in close actuarial balance since the tax rate is only 86 percent of the cost rate.

Short-Range Financing (1982-86)

Table 5 shows 5-year projections for the amounts of money in the various trust funds under the four sets of assumptions. By using such cost projections, Congress and the Administration can monitor and adjust income to the programs. In this short-range period, the number of persons receiving OASDI benefits can be forecast closely. Changes in the national economy can have major effects on outgo and income, however, and are difficult to predict. A series of economic downturns more severe than anticipated have led to the current financial situation.

This year's trustees report confirms last year's warnings that remedial legislation is needed to keep the OASI Trust Fund from becoming depleted very soon. The interfund borrowing legislation enacted in 1981 provides a solution only until mid-1983. The amounts to be borrowed by the OASI fund during 1982, based on the four sets of assumptions, are shown in table 6.

The interfund borrowing authority expires at the end

Table 5.—OASDI Trust Funds at beginning of year, under various economic assumptions, 1982-86

[In billions]

Trust Fund(s)	Assumptions			
	Alternative I	Alternative II-A	Alternative II-B	Alternative III
OASI:				
1982.....	\$21.5	\$21.5	\$21.5	\$21.5
1983.....	15.4	15.7	16.8	17.5
1984.....	1.0	-.8	-2.6	-6.4
1985.....	-12.7	-20.9	-26.6	-41.0
1986.....	-18.4	-35.9	-50.5	-78.9
OASI and DI:				
1982.....	24.5	24.5	24.5	24.5
1983.....	16.9	17.2	18.4	19.0
1984.....	10.4	8.3	6.0	1.5
1985.....	7.4	-1.7	-8.6	-25.0
1986.....	19.6	.7	-16.7	-48.4
OASI, DI, and HI:				
1982.....	43.3	43.3	43.3	43.3
1983.....	37.9	38.4	34.2	33.4
1984.....	33.5	31.3	22.5	15.6
1985.....	31.0	20.9	5.7	-15.1
1986.....	43.4	21.9	-6.4	-46.1

Table 6.—Amounts to be borrowed by the OASI Trust Fund during 1982

[In billions]

Borrowed from—	Alternative I	Alternative II-A	Alternative II-B	Alternative III
Total . . .	\$7.1	\$7.0	\$11.1	\$12.3
DI fund	6.2	6.3	5.7	5.6
HI fund	0.9	0.8	5.3	6.7

of 1982. Under this authority, the Managing Trustee is authorized to make loans among the three funds—OASI, DI, and HI. The amount that may be borrowed by one trust fund at any time in 1982 is limited to no more than the amount necessary to assure timely payment of benefits during the 6 months following the date of the loan.

Thus, full use of this authority would permit the OASI Trust Fund to pay benefits on time through June 1983; under present law, the OASI fund would be unable to pay benefits on time beginning in July 1983. The OASI and DI Trust Funds, if combined, would be unable to pay OASDI benefits when due sometime later in 1983. Table 7 shows the dates when the various funds would no longer be able to pay timely benefits under current law.

Even if the OASI, DI, and HI Trust Funds were combined, they would be depleted in 1984 under the Alternative II-B assumptions, or as early as the end of 1983 under the pessimistic Alternative III assumptions. Under the Alternative II-A assumptions, the three combined trust funds would just barely be able to pay benefits on time through the 1980's, with no margin of safety for even slightly less favorable economic conditions.

The interfund borrowing provisions of the present law would have a favorable effect on the combined OASDI funds but would have an unfavorable effect on the HI fund. Under the present interfund borrowing law, the HI Trust Fund would be able to pay benefits without delay until a date ranging from 1986 to 1991, depending on the set of assumptions used. If interfund

Table 7.—Date when fund(s) could no longer pay benefits on time under current law

Trust Funds	Alternative I	Alternative II-A	Alternative II-B	Alternative III
OASI	July 1983	July 1983	July 1983	July 1983
OASI and DI ¹	Late 1983	Late 1983	Late 1983	Late 1983
HI ²	1991	1989	1987	1986
OASI, DI, and HI	1984	1983-84

¹ Assuming current law were changed to allow extended interfund borrowing.

² If interfund borrowing were not permitted, dates for the HI fund would be extended by approximately 5 weeks or less, depending on the assumptions used.

borrowing had not been permitted, however, it is estimated that these dates for exhaustion of the HI fund would be extended by up to about 5 weeks, again depending on the set of assumptions used.

Chart 1 shows the projected fund ratios through 1991 for the three funds combined. Even on this basis, which assumes the law would be changed to allow unlimited interfund borrowing, there is a need to strengthen the short-range financing. The combined funds would barely get through the early 1980's under the two more favorable sets of assumptions, and under the other two less favorable projections, the combined funds would be used up within a few years. Thus, any reallocation of the tax rates or borrowing among the trust funds would not result in adequate short-range financing under adverse conditions, and so would be unsatisfactory.

Long-Range Financing (1982-2056)

Long-range cost estimates for OASDI over the next 75 years, although sensitive to variations in the assumptions, give the best available indication of the trend and general range of the program's cost. Several important long-range demographic trends, which are already under way, are anticipated to raise the proportion of the aged in the population over the next 75 years:

- (1) Because of the large number of persons born shortly after World War II, rapid growth is expected in the aged population after the turn of the century.
- (2) Projected improvements in mortality also would increase the number of aged persons. Table 8 illustrates the improvement in life expectancies that is anticipated, based on the Alternatives II-A and II-B.
- (3) At the same time, low birth rates would hold down the number of young people.

Chart 2 shows the long-range trend in the number of OASDI beneficiaries per 100 covered workers, based on the three sets of demographic assumptions. (Both Alternatives II-A and II-B are based on the same set of demographic assumptions.) It is important to note that "beneficiaries" includes not only retired workers, but also disabled workers, spouses, children, and survivor beneficiaries. This ratio has gone up from zero in 1940 to 31 currently. It is estimated to rise to a range of 39 to 76 by the middle of the next century. Because most of the beneficiaries during the next 75 years have already been born, their numbers are projected mainly from the present population. The number of workers in these projections, however, depends on future birth rates, which are subject to more variability.

Table 8.—Past and projected life expectancies¹ based on Alternatives II-A and II-B

Calendar year	At birth		At age 65	
	Men	Women	Men	Women
1940.....	61.1	65.6	12.0	13.7
1960.....	66.7	73.4	13.0	16.1
1980.....	69.8	77.7	14.3	18.7
2000.....	72.9	81.1	15.8	21.1
2020.....	73.8	82.1	16.4	22.0
2040.....	74.6	83.1	17.0	22.8
2060.....	75.4	84.1	17.6	23.6

¹ Life expectancy is the average number of years of life remaining, based on the death rates at each age in the year shown.

Chart 3 shows the trend in the estimated annual OASDI cost rate (outgo as a percentage of taxable payroll) under each of the four sets of assumptions during the next 75 years. Also shown for comparative purposes are the scheduled OASDI tax rates payable by employer and employee combined. Under each set of assumptions, the cost rate increases rapidly after 2005. Under the Alternatives I, II-A, and II-B assumptions, the outgo in relation to taxable payroll peaks around 2030, but under the Alternative III assumptions, the outgo is still increasing at the end of the valuation period. These projections indicate the need for action to restore the OASDI system to financial health over the long range.

Table 9 compares the estimated average OASDI cost rates and tax rates over the next 75 years under the four alternative sets of assumptions. The estimated average annual tax rate for the entire 75-year projection period

Table 9.—Estimated average OASDI tax rates, cost rates, and actuarial balance, 1982-2056

[Percentage of taxable payroll]

Calendar year	Scheduled tax rate	Estimated cost rate ¹				Actuarial balance ²			
		Alternative I	Alternative II-A	Alternative II-B	Alternative III	Alternative I	Alternative II-A	Alternative II-B	Alternative III
25-year average:									
1982-2006.....	12.01	9.75	10.46	11.37	12.73	2.26	1.55	0.64	-0.72
2007-2031.....	12.40	11.30	13.15	14.08	17.84	1.10	-0.75	-1.68	-5.44
2032-2056.....	12.40	11.88	15.65	16.81	25.66	0.52	-3.25	-4.41	-13.26
75-year average:									
1982-2056.....	12.27	10.98	13.09	14.09	18.75	1.29	-0.82	-1.82	-6.47

¹ Cost rate is the estimated outgo as a percentage of taxable payroll.

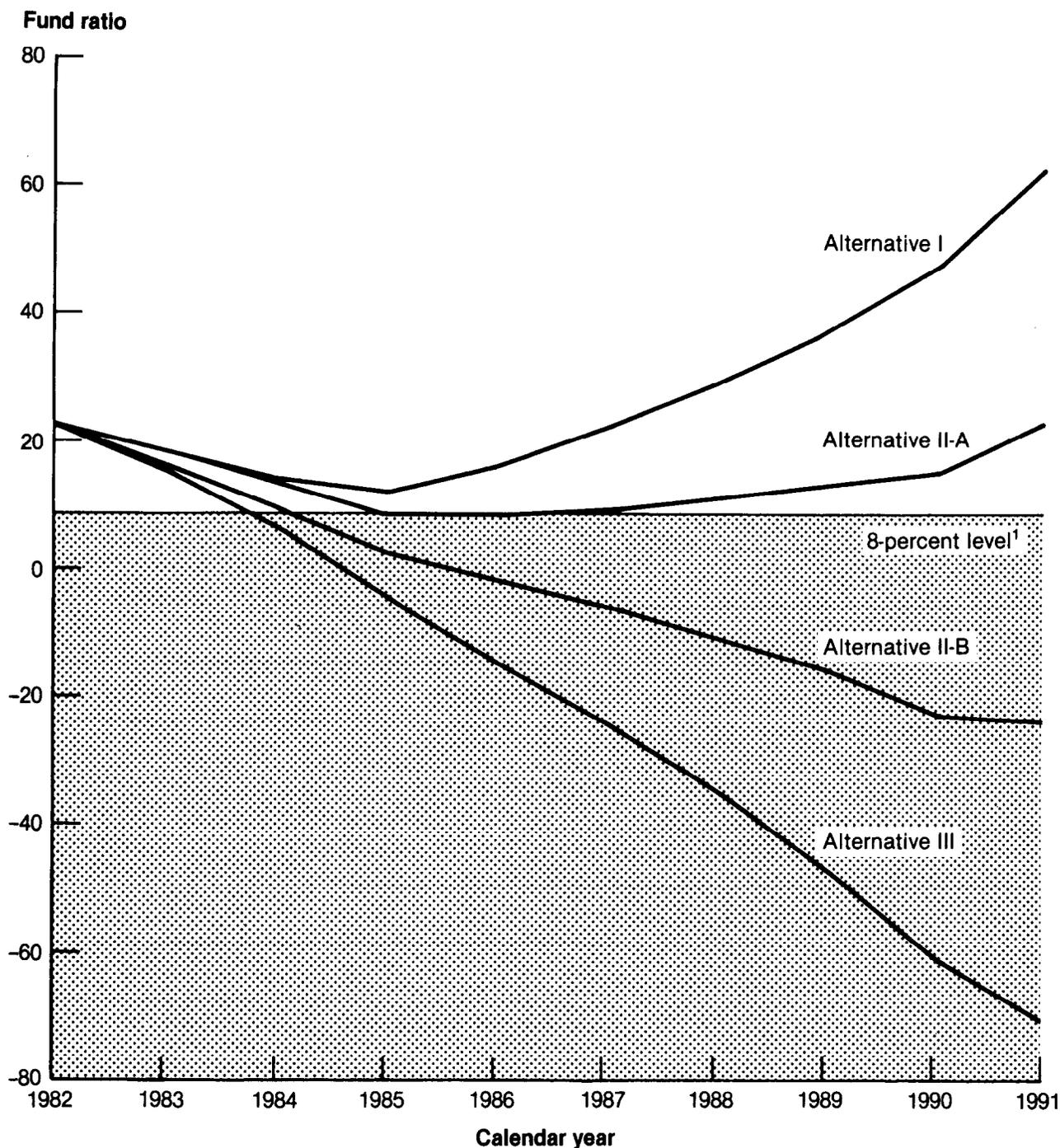
² Actuarial balance is the difference between the tax rate and the cost rate.

falls below the estimated average annual outgo for the period by 0.82 percent of taxable payroll under Alternative II-A and 1.82 percent under Alternative II-B.

Over the medium range—the next 25 years—the OASDI system has an actuarial surplus under all but the most pessimistic assumptions, largely because of the tax rate increase scheduled for 1990.

Based on the Alternative II-A assumptions, which are consistent with the economic assumptions in the President's 1983 Budget, the long-range average deficit for OASDI over the next 75 years is estimated to be 0.82 percent of taxable payroll. In the 1981 trustees report, the long-range deficit based on these assumptions was somewhat higher, at 0.93 percent of payroll. The legisla-

Chart 1.—Estimated combined OASI, DI, and HI Trust Fund ratios under alternative sets of assumptions, 1982-91



¹A fund ratio as low as 8 percent would usually imply inability to pay all benefits on time.

tion enacted in 1981 reduced the deficit by an estimated 0.18 percent of payroll. Part of this reduction was offset, however, by the net effect of other changes in the estimate—changes in the valuation period, the short-range economic assumptions, disability assumptions, benefit and payroll levels due to later experience, and methodology.

Based on the Alternative II-B assumptions, which reflect somewhat lower economic growth than in Alternative II-A, the long-range deficit remains the same as in last year's report—1.82 percent of payroll. The reduction in the deficit that resulted from the 1981 legislation, 0.19 percent of payroll, was offset by the net effect of the other changes in the estimates.

Chart 2.—Number of OASDI beneficiaries per 100 workers, 1940-2060

**OASDI beneficiaries
per 100 workers**

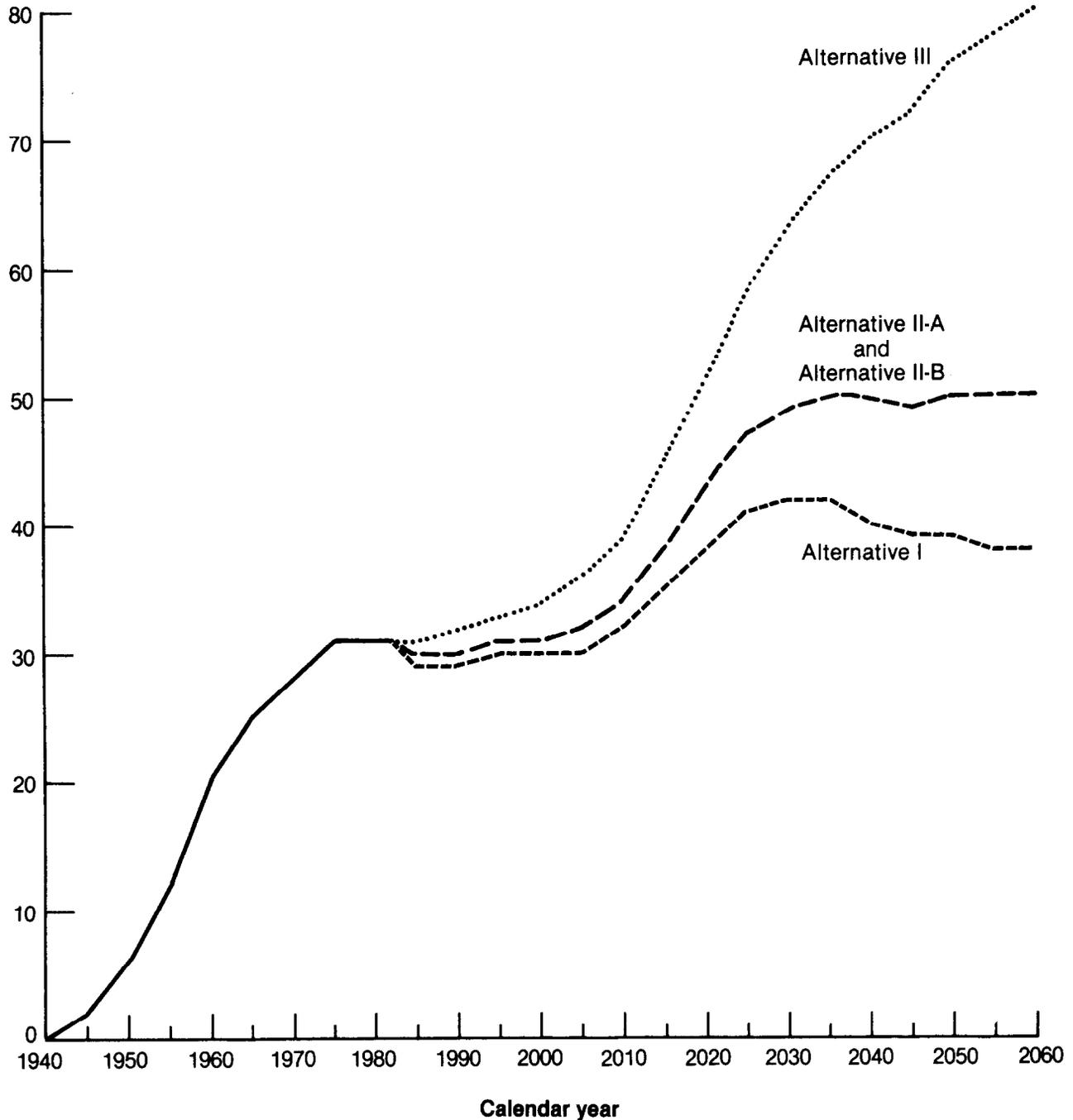


Chart 3.—Estimated OASDI tax rates needed to cover program costs, 1982-2060

