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

by Harry C. Ballantyne*

This article summarizes the current financial and actuarial status of the Old-Age, Survivors, and Disability Insurance (OASDI) program. The data presented are from the 1983 Trustees Report for the program following enactment of the Social Security Amendments of 1983. The actuarial estimates show that benefits can be paid on time throughout the 1980's and for many years thereafter. However, trust fund levels are projected to be relatively low through 1987, and the program could again experience financial difficulties in the near future if economic conditions become worse than anticipated under the pessimistic Alternative III assumptions. After 1987, the program's ability to withstand economic downturns is projected to improve. On the basis of intermediate assumptions, the OASDI program is now in long-range actuarial balance. This actuarial balance reflects substantial year-by-year surpluses during the first half of the 75-year projection period that slightly outweigh substantial deficits later on.

Two separate Social Security trust funds pay monthly cash benefits to workers and their families. Benefits for retired workers and their families and for survivors of deceased workers are paid by the Old-Age and Survivors Insurance (OASI) Trust Fund, and benefits for disabled workers and their families are paid by the Disability Insurance (DI) Trust Fund. These two parts of the Social Security program—OASI and DI—are collectively referred to as OASDI.

The Social Security program is financed essentially on a pay-as-you-go basis. That is, as taxes are paid into the system, they are used to pay benefits to beneficiaries. The trust funds hold all assets not currently needed to pay benefits and administrative expenses. The trust funds may not be used for any other purposes.

The Secretaries of the Treasury, Labor, and Health and Human Services serve as trustees of the Social Security trust funds. They report annually to the Congress on the condition of each fund and on each fund's projected financial operations.

This article, adapted from the 1983 Trustees Report,¹ presents a summary of the current financial and actuarial status of the OASI and DI Trust Funds. All figures

are on a calendar year basis, and are for the OASDI program as it is now structured following enactment of the Social Security Amendments of 1983.²

OASDI Income and Trust Funds

Most OASDI revenue comes from payroll taxes paid by employees, their employers, and the self-employed. (Additional payroll taxes go into a separate trust fund for the Hospital Insurance (HI) part of Medicare. Because this summary focuses on OASDI, it does not discuss Medicare except in the context of interfund borrowing.³)

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 \$35,700 in 1983. In future years, the Social Security earnings base will rise as average wages increase. For the self-employed, the 1983 OASDI tax rate is about 1 1/2 times the rate for employees, and after 1983 it will be the same as the combined employee-employer rate.

² A full summary of the amendments was carried in the July 1983 issue of the **Social Security Bulletin**. See John A. Svahn and Mary Ross, "Social Security Amendments of 1983: Legislative History and Summary of Provisions," pages 3-48.

³ Pages 9-15 in this issue of the **Bulletin** present a summary of the actuarial status of the two Medicare trust funds.

* Chief Actuary, Social Security Administration.

¹ **1983 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds**, Social Security Administration, June 24, 1983.

Table 1.—Schedule of OASDI tax rates: Contribution rates payable by employer and employee (each)

[Percent of taxable earnings]

Calendar year	OASDI	OASI	DI
1983	5.40	4.775	0.625
1984-87	5.70	5.200	.500
1988-89	6.06	5.530	.530
1990-99	6.20	5.600	.600
2000 and later	6.20	5.490	.710

For 1984 only, a tax credit of 0.3 percent of taxable wages (equal to the 1984 tax rate increase for employees) will be allowed against the taxes paid by employees. Similarly, certain tax credits will also be allowed against taxes on self-employment income from 1984 to 1989. Beginning in 1990, self-employed persons will be allowed to deduct from their net self-employment earnings an amount equal to such income multiplied by one-half of the Social Security tax rate for the self-employed. Then half of the Social Security tax liability will be deductible in computing Federal income taxes for the self-employed. The effect of this procedure will be to place self-employed persons in roughly the same position as employees in regard to their Social Security and Federal income taxes.

The trust funds serve as a contingency reserve to absorb temporary fluctuations in OASDI income and outgo. When income exceeds outgo, the trust funds increase. When outgo exceeds income, the trust funds are drawn down. The assets of the trust funds are generally invested in U.S. Government securities bearing rates of interest similar to those for long-term securities issued to the general public.

The exact timing of income and outgo can be important under pay-as-you-go financing. In order to match OASDI income with outgo more closely, the so-called "normalized" crediting of taxes took effect in May 1983. This part of the 1983 amendments provides that Treasury advances each month's payroll tax receipts to the trust funds at the beginning of the month, when cash benefits are paid. The trust funds pay interest to the Treasury for such advance payments. The net effect is to make income in each month available when benefits are paid in the same month.

After 1983, the taxation of Social Security benefits will provide another significant source of OASDI income. The proceeds from this tax will be transferred from the general fund of the Treasury to the trust funds, in advance—on an estimated basis—at the beginning of each calendar quarter. The trust funds do not pay interest to the Treasury for such advance payments.

The law extends limited interfund borrowing authority among the OASI, DI, and HI funds through 1987. Any loans, including those already made in 1982, must

be repaid with interest before 1990.⁴ Also, OASDI tax rates were reallocated between OASI and DI to put both funds in approximately the same financial condition.

Operations of the Trust Funds

Table 2 presents a summary of 1982 financial operations for the OASI and DI Trust Funds, including cash income (revenue), outgo (disbursements), and changes in assets during 1982. The financial results for 1981 are shown for comparative purposes.

In 1982, interfund borrowing was used for the first time. The OASI fund borrowed a total of \$17.5 billion—\$12.4 billion from the HI fund and \$5.1 billion from the DI fund—to pay November and December 1982 benefits and to continue all benefit payments through mid-1983.

Chart 1 shows that 1982 was the first year since 1974 that the combined OASI and DI funds increased. However, the 1982 increase of \$0.2 billion reflects the effect of the \$12.4 billion loan from the HI fund. Without this loan, OASDI assets would have decreased by about \$12 billion, or 1 percent of taxable payroll.

Actuarial Cost Projections

As required by law, the annual Trustees Reports contain projections of each fund's estimated financial operation and status. For the OASDI program, these

⁴ For a discussion of the interfund borrowing provisions, see Bruce D. Schobel, "Interfund Borrowing Under the Social Security Act," *Social Security Bulletin*, September 1983, pages 13-14.

Table 2.—Financial operations of the OASI and DI Trust Funds, calendar years 1981 and 1982

[In billions]

Item	1982 OASDI financial results			1981 OASDI financial results
	OASDI	OASI	DI	
Assets at beginning of year	\$24.5	\$21.5	\$3.0	\$26.5
Income in year, total	147.9	125.2	22.7	142.4
Tax contributions	145.7	123.7	22.0	139.4
Interest	1.4	.8	.5	2.2
General fund of Treasury9	.7	.2	.8
Outgo in year, total	160.1	142.1	18.0	144.4
Benefit payments	156.2	138.8	17.4	141.0
Administrative expenses ¹	2.1	1.5	.6	1.7
Transfer to Railroad Retirement account	1.8	1.8	(2)	1.6
Interfund loans: amounts received	12.4	17.5	-5.1	...
Net change in assets2	.6	-.4	-1.9
Assets at end of year	24.8	22.1	2.7	24.5

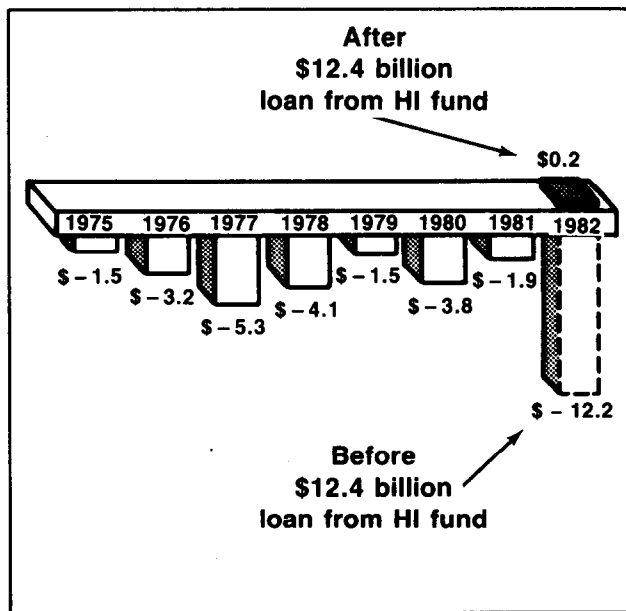
¹ Includes cost of rehabilitation. Administrative expenses for OASDI in 1982 were 1.3 percent of outgo.

² Less than \$0.05 billion.

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

Chart 1.—OASDI deficits and surplus, 1975–82

[In billions]



estimates extend over the next 75 years. The projected costs after the first few years are presented as percentages of taxable payroll. Because 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.

Assumptions Used

Future OASDI income and outgo will depend on mortality, fertility, unemployment, inflation, and other economic and demographic factors. Demographic factors affect the number of persons paying Social Security taxes and receiving benefits, and economic factors affect the levels of wages and Social Security benefits.

This year's cost projections were prepared using four sets of assumptions regarding these factors. Alternative I reflects a relatively optimistic view of the external factors that determine Social Security costs. The less optimistic Alternative II-A assumes future economic performance resembling the experience in periods of robust economic growth. Alternative II-B assumes lower economic growth. Alternative III reflects a more pessimistic view of the factors that will determine Social Security costs.

Table 3 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 range of any of these assumptions. However, it is not considered likely that actual experience will lie outside the range of the assumptions.

Table 3.—Economic and demographic assumptions used under the four alternatives

Calendar year	Percentage increase over previous year in average annual—			Average percentage unemployed	Total fertility rate ²
	Real GNP ¹	Wages in covered employment	Consumer Price Index		
Alternative I (optimistic)					
1983.....	3.4	4.3	2.5	10.0	1.9
1984.....	5.7	5.2	3.3	8.6	1.9
1985.....	5.1	5.3	3.7	7.5	1.9
1995.....	3.8	4.5	2.0	4.0	2.1
2005 and later ...	3.6	4.5	2.0	4.0	2.3
Alternative II-A (intermediate)					
1983.....	3.1	4.3	2.7	10.0	1.9
1984.....	4.8	5.0	3.6	8.8	1.9
1985.....	4.1	4.8	4.0	7.9	1.9
1995.....	3.3	5.0	3.0	5.0	1.9
2005 and later ...	3.1	5.0	3.0	5.0	2.0
Alternative II-B (intermediate)					
1983.....	2.4	4.6	3.1	10.1	1.9
1984.....	4.1	4.6	4.4	9.1	1.9
1985.....	3.7	5.5	5.3	8.3	1.9
1995.....	2.6	5.5	4.0	5.5	1.9
2005 and later ...	2.6	5.5	4.0	5.5	2.0
Alternative III (pessimistic)					
1983.....	.5	3.9	3.3	10.5	1.8
1984.....	1.7	4.6	6.4	10.5	1.8
1985.....	3.9	7.4	7.7	9.5	1.8
1995.....	2.1	6.0	5.0	6.5	1.7
2005 and later ...	2.1	6.0	5.0	6.5	1.6

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 3.2 percent, 2.3 percent, 1.9 percent, and 0.8 percent for Alternatives I, II-A, II-B, and III, respectively.

² The number of children who would be born to a woman in her lifetime (assuming that she survives the childbearing years) based on the birth rates at each age in the year shown.

Measures of Actuarial Status

In analyzing the financing of the program, several measures of actuarial status are used. The terminology is defined below.

The **fund ratio** is the amount in the trust fund at the beginning of a year expressed as a percentage of that year's expenditures. For example, a fund ratio of 25 percent means that the amount in the fund is one-fourth of annual outgo (enough to pay benefits for about 3 months in the absence of any income). At the beginning of 1983, the fund ratios for OASI and DI were both 15 percent. (Of course, the actual ratio for any year will not be known until the year is completed and the amount of expenditures is known. Before the year is completed the ratio can only be estimated.) A fund ratio below 8 percent would represent less than 1 month's benefit outgo, and thus would usually imply inability to pay benefits on time. In practice, to assure payment of benefits in the short range, higher levels of about 12 to

14 percent would be needed because OASDI income and outgo fluctuate during the year, and because unforeseen changes in the economy may cause the trust funds to drop unexpectedly. A new stabilizer provision takes effect at the end of 1984 to help avoid the need for hasty legislative action to assure payment of benefits on time. Under the stabilizer provision, if the trust fund ratio falls below 15 percent (20 percent after 1988), annual benefit increases will be based on the lower of wage or price increases, instead of on price increases alone, with provision for higher benefit increases later to catch up with price increases.

The **cost rate** is the annual outgo as a percentage of taxable payroll. Also, the **total income rate** (or simply the income rate) is the combined OASDI employee-employer payroll tax rate scheduled in the law plus the rate of income from the taxation of benefits, expressed as a percentage of taxable payroll. Over time, the average income rate and cost rate can be compared directly to measure the adequacy of financing. For the entire long-range projection period of 75 years, the **actuarial balance** is the difference between the average income rate and the average cost rate. If this actuarial balance is positive, the system is said to have an actuarial surplus, and if negative, an actuarial deficit. Such a deficit is a warning that long-range financing may need to be strengthened, although it does not give a complete picture without the other measures of financing discussed here. The program is said to be in **close actuarial balance** over the long-range if the average income rate is 95 to 105 percent of the average cost rate.

Short-Range Financing (1983-87)

Projections over the next 5 years are used by the Congress and the Administration to monitor OASDI financing. In this short-range picture, the number of persons receiving OASDI benefits can be forecast closely. However, changes in the national economy can have major effects on outgo and income and are difficult to predict.

The 1983 Trustees Report shows that under all four projections OASDI can pay benefits on time throughout the next 5-year period. This is in marked contrast to the situation shown in recent Trustees reports, which indicated that reserves were rapidly being depleted. Before enactment of the 1983 amendments, the fund assets were adequate to pay OASI benefits through June 1983 only because of temporary legislative changes, including interfund borrowing authority.

Chart 2 shows the year-by-year surpluses projected during 1983-90 under the Alternative II-B assumptions. The amounts shown are lower than they would otherwise be because of repayment during these years of the \$12.4 billion borrowed from the HI fund.

Chart 3 shows the projected progress of OASDI fund

Chart 2.—OASDI surplus projected by Alternative II-B assumption, 1983-90

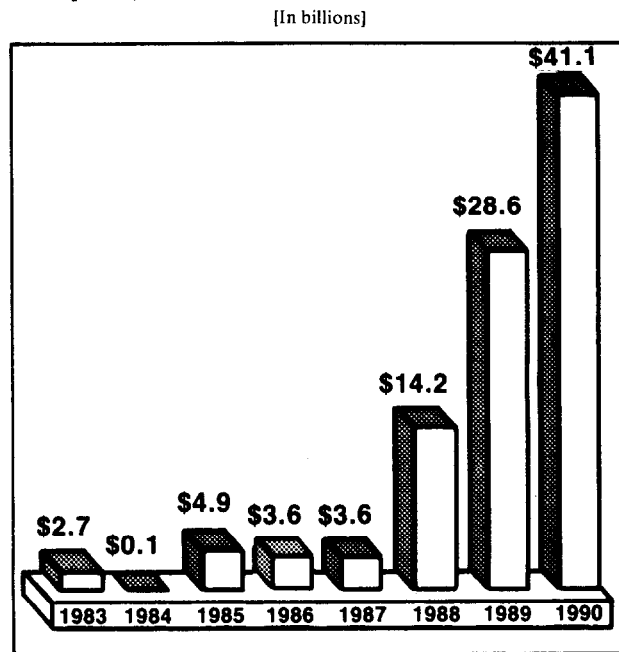
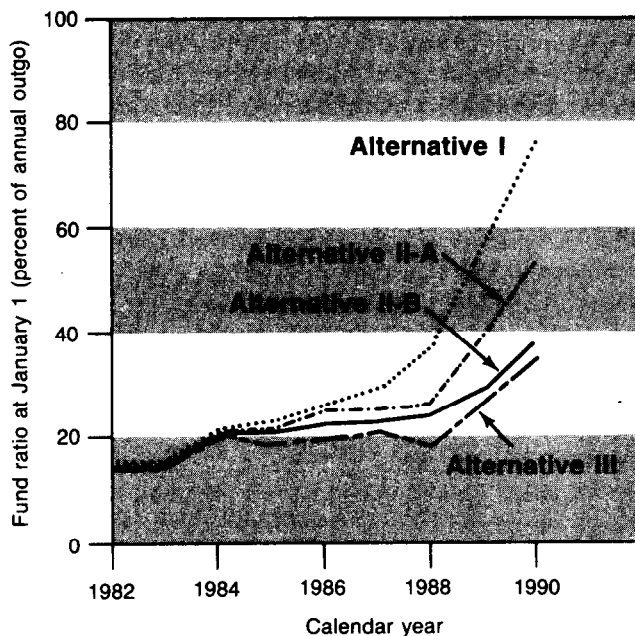


Chart 3.—OASDI fund ratios, 1982-90



ratios under all four sets of assumptions during 1982-90. As of January 1, 1983, the ratio was at 15 percent for OASDI. (Both the OASI and DI fund ratios also were 15 percent.) By 1984, the fund ratio jumps to the 21-22 percent level, reflecting both the normalized crediting of taxes and a lump-sum payment to the OASDI fund for military service credits. Then for several years, the OASDI fund ratio is projected to grow slowly, reaching more than 30 percent between 1988 and 1990 under the Alternative II-B assumptions. After that, reserves are projected to increase more rapidly, re-

flecting higher payroll tax rates. Thus, during the next few years, margins of safety are thin; thereafter the funds are less vulnerable to the adverse effects of an economic downturn.

Under all four sets of assumptions the \$5.1 billion borrowed from the DI fund would be fully repaid, with interest, in 1988 or 1989. The \$12.4 billion borrowed from the HI fund would be fully repaid, with interest, in 1987 or 1988. Under the pessimistic assumptions, this loan would be repaid in 1987 when, according to that set of assumptions, it will be needed by the HI fund to pay benefits.

Long-Range Financing (1983-2057)

Long-range cost estimates—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 future cost. In this long-range period, Social Security costs should tend to respond largely to demographic conditions. Most of the beneficiaries during the next 75 years have already been born, so that their numbers are projected mainly from the present population. The number of workers involved in these projections, however, depends on future birth rates, which are subject to more variability. Several important long-range demographic trends, already under way, are anticipated to raise the proportion of the aged in the population in the next 75 years:

- 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.
- At the same time, low birth rates would hold down the number of young people.
- Projected improvements in mortality also would increase the numbers of aged persons.

Table 4 shows the improvement in life expectancies that is anticipated, based on Alternative II-A and II-B (intermediate) assumptions.

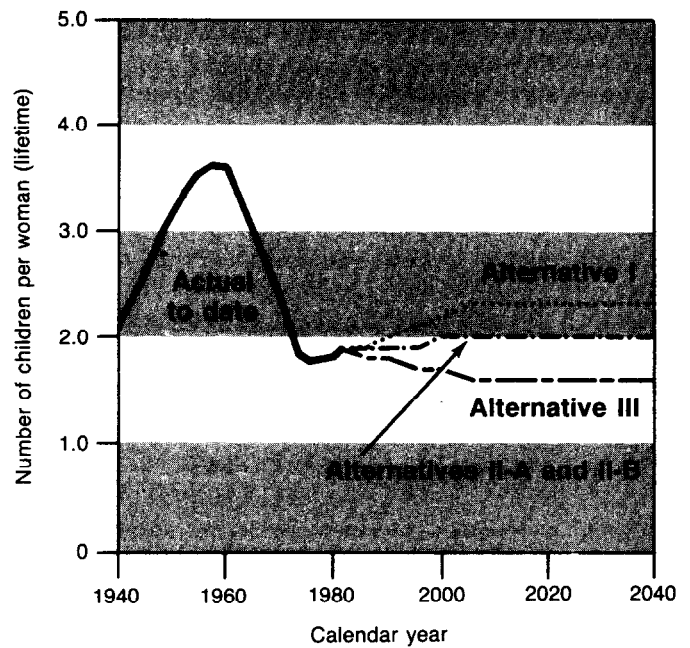
Chart 4 illustrates fertility rates experienced from 1940 to 1980 and projected over future years under the three sets of demographic assumptions. The post-World

Table 4.—Past and projected life expectancies¹

Year	At birth		At age 65	
	Male	Female	Male	Female
1940	60.9	65.3	11.9	13.4
1960	66.6	73.2	12.9	15.9
1980	69.8	77.5	14.0	18.3
2000	73.4	81.0	15.7	20.8
2020	74.4	82.2	16.4	21.7
2040	75.4	83.3	17.2	22.6
2060	76.3	84.4	17.9	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. Rates are based on census data through 1980 and are projected beyond 1980 on the basis of the intermediate assumptions.

Chart 4.—Total fertility rates, 1940-2040



War II baby boom shows up clearly, followed by the historically low fertility rates of recent years.

Chart 5 shows the long-range trend in the number of OASDI-covered workers for each Social Security beneficiary, based on the three sets of demographic assumptions. ("Beneficiaries" includes not only retired workers, but also disabled workers, spouses, children, and survivor beneficiaries.) This ratio has fallen from 5.1 in 1960 to 3.2 currently. It is estimated to reach a level of about 2 by the middle of the next century, as the number of beneficiaries increases more rapidly than the number of OASDI-covered workers.

Chart 5.—Number of workers per OASDI beneficiary, 1960-2060

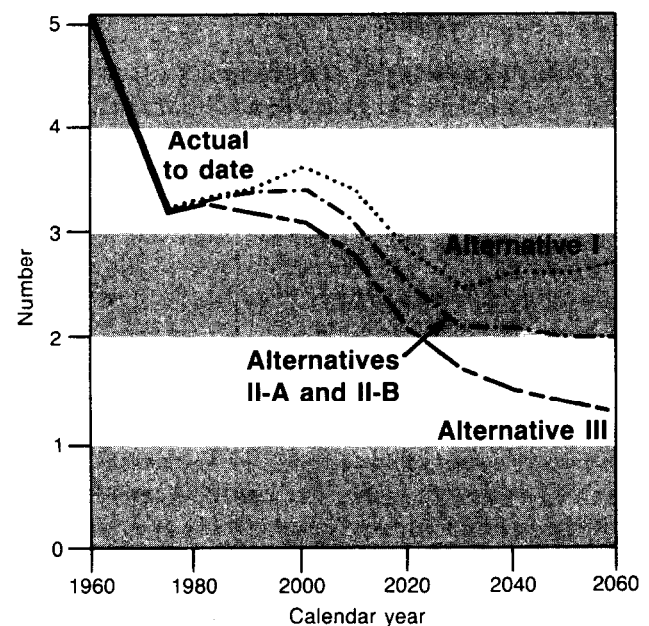


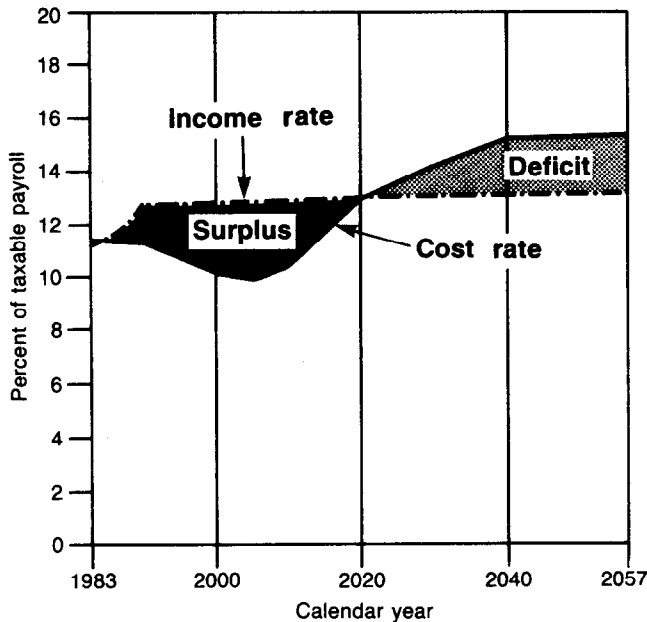
Table 5 shows the trend in the estimated annual OASDI cost rate (outgo as a percentage of taxable payroll) under each of the four sets of assumptions during the next 75 years. Under each assumption, the cost rate increases rapidly after the turn of the century. Under Alternatives I, II-A, and II-B, the outgo in relation to taxable payroll is fairly level or decreasing after 2030, while under Alternative III the outgo is still increasing at the end of the 75-year period.

Chart 6 shows the estimated OASDI cost rates and income rates over the next 75 years based on the Alternative II-B assumptions. During the first half of this

Table 5.—Estimated OASDI long-range cost rates, as a percentage of taxable payroll, selected years

Year	Alternative assumptions			
	I—optimistic	II-A—intermediate	II-B—intermediate	III—pessimistic
1983	11.46	11.49	11.49	11.62
1990	10.15	10.70	11.27	11.38
2000	8.14	9.32	10.08	11.25
2010	8.22	9.57	10.31	11.93
2020	10.02	11.91	12.76	15.43
2030	11.00	13.71	14.73	19.17
2040	10.60	14.05	15.17	21.71
2050	10.16	14.13	15.27	23.82
2057	10.07	14.28	15.42	25.08

Chart 6.—Income rates and cost rates projected by Alternative II-B assumptions, 1983–2057



period, the projection shows that income will generally exceed outgo, developing a substantial surplus each year. After 2020 the reverse is true, with outgo exceeding income and thus generating substantial deficits. Over the entire period, such surpluses and deficits are approximately in balance.

After 1990, when the scheduled employee-employer payroll tax rate has leveled off at 12.4 percent, the income rate continues to rise slightly as a result of taxation of OASDI benefits—from 12.7 percent in 1990 to 13.2 percent in 2060 under the Alternative II-B assumptions.

Table 6 compares the estimated OASDI cost rates and income rates for the next 75 years under the four sets of assumptions. The estimated average annual income rate for the entire 75-year projection period exceeds the average annual cost rate for the period by 0.84 percent of taxable payroll under Alternative II-A and 0.02 percent under Alternative II-B. Thus, under Alternative II-B the OASDI program now is in close actuarial balance, and the large deficit that was projected a year ago has been eliminated. The actuarial balance is a moving average that is recomputed each year, and continuing review of OASDI financing is necessary.

Conclusion

The Social Security Amendments of 1983 have restored the financial integrity of the Social Security cash benefit program for many years into the future. During this decade, the program is now estimated to be adequately financed based on all four sets of actuarial assumptions. Over the next 75 years, the program is now estimated to be financially sound on the basis of all but the most pessimistic of the assumptions used.

Table 6.—Estimated 75-year average OASDI cost rates, income rates, and actuarial balance, as a percentage of taxable payroll

Alternative assumptions	Income rate	Cost rate ¹	Actuarial balance ²
I—optimistic	12.73	9.81	2.92
II-A—intermediate	12.83	11.99	.84
II-B—intermediate	12.87	12.84	.02
III—pessimistic	13.04	16.56	-3.51

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

² Actuarial balance is the difference between the income rate and the cost rate before rounding.