G. LONG-RANGE ACTUARIAL ESTIMATES

The long-range financial estimates provided in this section generally relate to the OASI and DI Trust Funds on a combined basis. However, as the OASI and DI programs are legally separate, a final assessment of the financial status of these funds must be provided on a separate basis, as is done later in this section. More detailed estimates for these trust funds, both separately and combined, can be found in section II.F.2 of this report.

Each year estimates of the financial and actuarial status of the OASDI program are prepared for the next 75 years. Although financial estimates for periods as long as 75 years are inherently uncertain, the results can provide valuable information for use by policymakers. In particular, such estimates can indicate whether the program—as seen from today's vantage point—is considered to be in satisfactory financial condition.
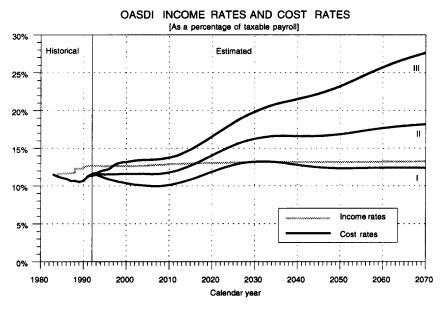
As mentioned previously, a number of different measures are useful in evaluating the financial status of the trust funds over the next 75 years. In addition to the actuarial balance and the trust fund ratio, emphasis is placed on the relationship between the levels of future tax income and future expenditures for each year (relative to the amount of earnings subject to the OASDI payroll tax). The year-by-year patterns of this relationship are of particular interest.

In addition to the presentation of long-range estimates, a specific test of the program's long-range financial status is applied. This test is referred to as the test for long-range "close actuarial balance."

1. Long-Range Income Rates, Cost Rates, and Annual Balances

The following chart compares past and estimated future OASDI income (from payroll taxes on covered earnings and income taxes on OASDI benefits) with OASDI expenditures (for benefits and administrative expenses). Included are historical data for the past 10 calendar years (1983-1992) and estimates for the 75-year long-range projection period (1993-2067) under the three alternative sets of assumptions. The chart includes values through 2070, as do many of the long-range tables in the Actuarial Analysis section, in which values are presented for every fifth year of the long-range period and

continue through 2070, thereby encompassing the full 75-year projection period which ends with 2067. These income and expenditure amounts are shown relative to the earnings in covered employment that are taxable under the OASDI program—referred to as "taxable payroll." The ratio of tax income to taxable payroll is called the "income rate" and the ratio of expenditures to taxable payroll is the "cost rate."

OASDI INCOME RATES AND COST RATES
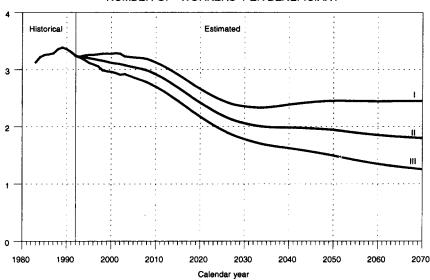[As a percentage of taxable payroll]

For calendar year 1993, the income rate for the OASDI program is estimated to be about 12.63 percent of taxable payroll. This rate is made up of the combined tax rate payable by employees and employers, 12.40 percent, plus the revenue from the income taxation of OASDI benefits, equivalent to 0.23 percent of taxable payroll. Since OASDI payroll tax rates are not scheduled to change in the future under present law, payroll tax income as a percentage of taxable payroll remains constant at about 12.40 percent. Income from the taxation of benefits will gradually increase, primarily because a greater proportion of beneficiaries will become subject to taxation. Thus, the income rate is projected to increase somewhat from its current level, reaching about 13.24 percent of taxable payroll by the year 2070. (The income rate projection shown in the chart is based on

alternative II only; the projections under alternatives I and III are very similar.)

As the chart indicates, the pattern followed by the estimated cost rates is much different. Costs as a percentage of taxable payroll are estimated to be relatively stable for about 15 years and then to increase rapidly for about the next 25 years. Thereafter, cost rates are estimated to grow less rapidly (or to decline somewhat, in the case of alternative I). By the year 2070 the cost rate is estimated to have reached 12.39 percent, 18.18 percent, and 27.62 percent under alternatives I, II, and III, respectively.

The primary reason that the estimated OASDI cost rate increases rapidly after about 2010 is that the number of beneficiaries is projected to increase more rapidly than the number of covered workers. Because the cost rate expresses expenditures (primarily payments to beneficiaries) as a percentage of taxable payroll (the taxable earnings of covered workers), there is a close relationship between the demographic characteristics of the population and the OASDI cost rate.

The following chart shows the estimated number of covered workers per OASDI beneficiary. In 1992, there were about 3.2 workers for every beneficiary. As indicated, this ratio is expected to decline substantially in the future under all three sets of assumptions. Most of this decline will occur as the relatively large number of persons born during the "baby boom" (from the end of World War II through the mid-1960s) reaches retirement age and begins to receive benefits. At the same time, the relatively small number of persons born during the subsequent period of low fertility rates will comprise the labor force. Between 2030 and 2050, the number of workers per beneficiary is relatively stable as the "baby-boom" generation diminishes in size. After the year 2050, this ratio will continue to decline, but at a slower pace, reflecting the increasing numbers of beneficiaries due to assumed increases in life expectancy. By the end of the 75-year projection period, the number of workers per beneficiary is projected to decline to 2.4, 1.8, and 1.3 under alternatives I, II, and III, respectively.

NUMBER OF WORKERS PER BENEFICIARY

The difference between the income rate and the cost rate in a given year is referred to as the "annual balance" for that year. The estimated pattern of the OASDI annual balance depends significantly on the economic and demographic conditions assumed to occur in the future. Income rates are estimated to exceed cost rates for the next 34, 24, and 4 years, under alternatives I, II, and III, respectively, resulting in positive annual balances. Thereafter, under the intermediate assumptions, the annual deficit would rise rapidly, reaching 2 percent of taxable payroll before 2025 and 4.94 percent in the year 2070. Under alternative I, a brief period of deficits (from 2027 through 2037) would be followed by a return to small positive balances lasting throughout the remainder of the projection period. Under adverse conditions, as assumed in alternative III, the deficit would grow very rapidly, to nearly 14 percent of taxable payroll by the year 2070.

2. Summarized Income Rates, Cost Rates, and Balances

It is useful to consider the income and cost rates on a summarized basis over the three 25-year subperiods that make up the 75-year projection period. For this purpose, the annual income rates are summarized by calculating the present value of future tax income for the period in question, and expressing it as a percentage of the

present value of future taxable payroll for that period. ("Present values" are used in financial analysis to calculate the lump-sum equivalent value, at a particular point in time, of a series of future amounts or transactions. See Glossary for additional information.) Similarly, a summarized cost rate is calculated, based on the present value of future expenditures as a percentage of the present value of future taxable payroll. The following table shows these summarized amounts for the OASDI program for the three 25-year subperiods.

	Income rate	Cost rate	Balance
Alternative I:			
1993-2017	12.68	10.53	2.15
2018-2042	12.97	12.76	.21
2043-2067	12.96	12.44	.52
Alternative II:			
1993-2017	12.72	11.87	.86
2018-2042	13.10	15.73	−2.63
2043-2067	13.18	17.28	−4.10
Alternative III:			
1993-2017	12.77	13.46	−.69
2018-2042	13.26	19.32	−6.07
2043-2067	13.50	24.39	−10.89

A significant surplus is shown under alternative II for the first subperiod only; thereafter, the program is projected to experience deficits, for the reasons outlined previously. Under the alternative I assumptions, summarized tax income would exceed summarized costs for each of the 25-year subperiods, but to a relatively smaller extent for the second subperiod. (The relatively less favorable outlook for the second subperiod occurs under alternative I because the "baby-boom" generation is retired essentially throughout this period, while the assumed higher ultimate fertility rates have not yet had their full effect on the estimated numbers of workers.) If the adverse conditions of alternative III are experienced, deficits would occur for all three subperiods.

To assess the overall financial balance for the entire long-range projection period, it is customary to calculate summarized income rates and cost rates for the full 75-year period. For this purpose, summarized income and cost rates are calculated on a present-value basis, as before. In addition, the summarized income rate is augmented by the value of trust fund assets on hand at the beginning of the period. Similarly, the summarized cost rate is adjusted to include an additional cost equivalent to requiring that the trust funds at the end of the period hold assets equal to 100 percent of the

following year's expenditures. The results of this calculation are shown in the following table.

	Income rate	Cost rate	Balance
Alternative I:			
1993-2067	13.07	11.91	1.16
Alternative II:			
1993-2067	13.21	14.67	−1.46
Alternative III:			
1993-2067	13.37	18.33	−4.96

The difference between the summarized income and cost rates is called the "actuarial balance" and ranges from a surplus of 1.16 percent of taxable payroll under the alternative I assumptions to a deficit of 4.96 percent under alternative III. Based on the intermediate assumptions, an actuarial deficit of 1.46 percent is projected, representing the difference between the summarized income rate of 13.21 percent and the corresponding cost rate of 14.67 percent.
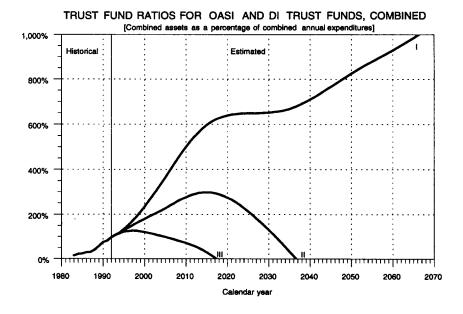
The size of the actuarial balance for any period represents a measure of the program's financial adequacy for that period. The actuarial balance can be interpreted as the amount of change which, if made to the payroll tax rates scheduled under present law for each year in the period, would bring the program into exact actuarial balance. For example, if the 75-year actuarial deficit of 1.46 percent under alternative II were addressed by raising scheduled tax rates by 0.73 percent for employees and employers, each, and by 1.46 percent for the self employed, then OASDI assets at the beginning of 1993, together with income from payroll taxes, interest, and other sources, would be just sufficient to meet all expenditures for the period and leave a trust fund level at the end of the period equal to 100 percent of the following year's expenditures. Of course, there are numerous other changes to tax rates or benefit provisions which could also result in the elimination of the long-range actuarial deficit.

The 75-year actuarial balance is a convenient and widely used measure of the OASDI program's overall financial status. It is important to remember, however, that this summary measure reflects the combined effects of several very different periods, as previously described. Thus, while use of summary measures such as the actuarial balance is often convenient, such measures should not be used as a substitute

for a more complete understanding of the underlying year-by-year outlook.

3.   Long-Range Projection of Trust Fund Assets

As noted previously, the total income of the OASDI program currently exceeds total expenditures by a substantial margin. As a result, the assets of the combined trust funds are increasing rapidly. Under the intermediate alternative II assumptions, this accumulation is expected to end about 16 years after the turn of the century, when the cost of the program increases with the retirement of the "baby-boom" generation. Thereafter, the tax rates scheduled in present law are expected to be insufficient to cover program expenditures and it will be necessary to use interest earnings and to redeem assets held by the combined OASI and DI Trust Funds to make up the shortfall. The resulting pattern of combined OASI and DI assets, expressed as a percentage of annual expenditures, is illustrated in the following chart under each of the three alternative sets of assumptions.

TRUST FUND RATIOS FOR OASI AND DI TRUST FUNDS, COMBINED

[Combined assets as a percentage of combined annual expenditures]

At the beginning of 1993, the combined assets of the OASI and DI Trust Funds represented about 107 percent of combined annual expenditures estimated for the year. Under alternatives I and II, this ratio would increase rapidly for at least the next 20 years. Based on the intermediate assumptions, assets would accumulate to a peak of 298 percent of expenditures in 2015, and would then decline steadily until exhaustion in the year 2036. Based on the intermediate estimates in last year's report, the peak fund ratio for the combined funds was estimated to be 334 percent. Under alternative I, assets would level off temporarily at about 650 percent of annual expenditures before continuing to climb to the level of about 10 years' expenditures by the year 2070. The pattern under alternative III is similar to that under alternative II, except the maximum level is lower (126 percent) and is reached sooner (1997), and exhaustion occurs earlier (2017). For OASI and DI, separately, the peak fund ratios based on the intermediate assumptions are 432 and 35 percent, respectively, in this year's report and 434 percent and 41 percent, respectively, in last year's report. The following table summarizes these projections for OASI, DI, and the combined trust funds under the three sets of assumptions for the period 1993 through 2070.

	OASI	DI	Combined
Alternative I:			
Maximum trust fund ratio (percent).............	1,218	35	1,044
Year attained.................................	2070	1993	2070
Year of exhaustion............................	—	1997	—
Alternative II:....................................			
Maximum trust fund ratio (percent).............	432	35	298
Year attained.................................	2016	1993	2015
Year of exhaustion............................	2044	1995	2036
Alternative III:			
Maximum trust fund ratio (percent).............	194	34	126
Year attained.................................	2011	1993	1997
Year of exhaustion............................	2025	1995	2017

As noted previously, trust fund assets are generally invested in special Treasury securities so that the excess of cash receipts over expenditures are borrowed from the trust funds by the general fund of the Treasury and used to help meet various Federal outlays. These securities are backed by the full faith and credit of the U. S. Government, as are all public-debt obligations of the U. S. Government. The assets of the trust funds can be redeemed for cash at any time if required to meet program expenditures. The redemption of a Treasury security held by a trust fund therefore requires that the Treasury transfer cash—obtained from another revenue source, such as

income taxes or borrowing from the public—to the trust fund. Thus, the investment operations of the trust funds result in various cash flows between the trust funds and the general fund of the Treasury.

The growth in OASDI assets, under alternative II, during the next 24 years will result in a substantial net cash flow from the trust funds of amounts borrowed by the general fund. Thereafter, this cash flow is expected to reverse; as trust fund securities are redeemed to meet benefit payments and other expenditures, revenue from the general fund of the Treasury will be drawn upon to provide the necessary cash. (It should be noted that DI Trust Fund assets are estimated to continue the decline that began in 1992 and to become exhausted in 1995, under alternative II. Thus, in the absence of corrective legislation, all the securities held by the DI Trust Fund would need to be redeemed during this period. However, this re-demption would be more than offset by new securities issued to the OASI Trust Fund through this period.) The accumulation and sub-sequent redemption of substantial trust fund assets has important public policy and economic implications that go well beyond the operation of the OASDI program itself. Discussion of these broader issues is not within the scope of this report.

4. Test of Long-Range Close Actuarial Balance

In order to assess the actuarial status of the OASDI program, an explicit test is applied to the long-range financial estimates based on the intermediate (alternative II) projections. This test is referred to as the test of long-range "close actuarial balance." The test of long-range close actuarial balance is characterized by the following:
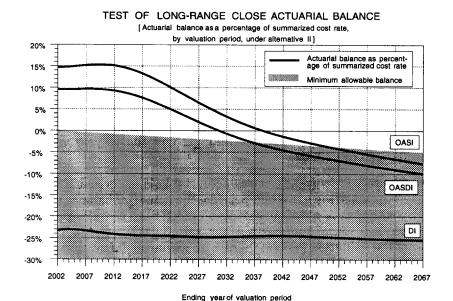
- The test covers 66 periods of time. It is applied to successively longer valuation periods, beginning first with the 10-year period 1993-2002, then the 11-year period 1993-2003, the 12-year pe-riod 1993-2004, and so on, until reaching the overall 75-year period 1993-2067.

- For each of these periods, an actuarial balance is calculated, in the same way as described previously for the 75-year period (including the value of assets available at the beginning of the period, and requiring an ending fund level of 100 percent of annual expenditures).

- For each period, the actuarial balance is compared to the sum-

marized cost rate for that period. If the balance is a deficit, it must not exceed a specified percentage of the corresponding cost rate.

The allowable tolerance for deficits over various time periods is designed to reflect the increasing uncertainty associated with longer projections. For the entire 75-year valuation period (1993-2067), the allowable tolerance is 5 percent. For the earlier, shorter valuation periods, the allowable margin is reduced uniformly from 5 percent, reaching zero for the 10-year valuation period (1993-2002).

• The test of long-range close actuarial balance is met if for each of the separate valuation periods, the actuarial balance is either positive or is a deficit that is no more than the allowable percentage of the summarized cost rate. In other words, if in any of the valuation periods there is an actuarial deficit that exceeds the allowable margin, then the test is not met.

The following chart illustrates the test of long-range close actuarial balance for the OASDI program, and for OASI and DI separately. For each valuation period, the actuarial balance is shown as a percentage of the corresponding cost rate for that period. The shaded area of the chart represents the unacceptable range for actuarial deficits. The test is not met if any part of the line representing the actuarial balance for the various valuation periods lies in the shaded area.

TEST OF LONG-RANGE CLOSE ACTUARIAL BALANCE
[Actuarial balance as a percentage of summarized cost rate,
by valuation period, under alternative II]

Ending year of valuation period

As can be seen, the actuarial deficits for the OASDI program (as a percentage of the summarized cost rates) exceed the allowable margins for all valuation periods ending in 2037 and later. Over the entire 75-year period, the deficit represents 9.96 percent of the 75-year cost rate, as compared to the allowable margin of 5 percent. Thus, although the OASDI program satisfies the short-range test of financial adequacy (as discussed earlier in this section), it fails to meet the test of long-range close actuarial balance.

The situation is similar for the OASI program considered separately. The OASI balances are slightly higher than for OASDI but fail to remain within the permitted tolerance for all periods ending in 2051 and later. Therefore, as was the case for OASDI, the OASI program meets the short-range test but is not in long-range close actuarial balance.

For the DI program, the balances are deficits that substantially exceed the allowable margins in every valuation period. Thus, the DI program does not meet the test of long-range close actuarial balance, in addition to the fact that it does not satisfy the short-range test of financial adequacy (as described earlier in this section).

H. CONCLUSION

Over the next 10 years, the OASI Trust Fund is expected to grow rapidly from a current level in excess of 100 percent of annual outgo to more than 2.5 times annual outgo by the year 2002. As a result, the OASI Trust Fund passes the short-range test of financial adequacy by a wide margin. However, the DI Trust Fund is not adequately financed. Outgo from the DI Trust Fund exceeded income in 1992, and outgo is expected to continue to surpass income until the fund is exhausted in 1995, 2 years earlier than the year of exhaustion that was projected in the 1992 Annual Report.

The OASI and DI Trust Funds, if combined, would be adequately financed over the next 10 years, and for many years thereafter. At the beginning of 1993, the combined assets of the trust funds represented about 107 percent of combined expenditures for 1993. The combined funds are projected to continue to grow during the next 10 years, and for many years thereafter, under alternatives I and II. However, while the assets of the combined funds, in nominal dollars, continue to grow under alternative III for the next 15 years, 1993 through 2007, the trust fund ratio of assets to annual expenditures begins to decline in 1998.

Although the combined trust funds are well financed over the next 10 years and are expected to continue growing, in nominal dollars, for about the next 3 decades under the intermediate assumptions, the OASDI program is not in close actuarial balance over the next 75 years, based on these assumptions. The estimates indicate that the combined trust funds would be sufficient to enable the timely payment of benefits for about the next 43 years. Relative to annual expenditures, the combined trust funds would continue to grow during the next 2 decades, reaching a peak of about 3 times annual expenditures. Considering each fund separately, the OASI Trust Fund would have sufficient funds for the next 51 years, but, as noted above, the DI Trust Fund would be exhausted in 1995, underscoring the need for corrective legislation. On the basis of the more pessimistic assumptions in alternative III, the combined funds would be sufficient to enable timely payment of benefits for about the next 24 years. The DI fund by itself, however, would be exhausted early in 1995. Based on the more optimistic assumptions of alternative I, the combined funds would continue to grow throughout the next 75 years, and they would be sufficient to enable timely payment of benefits

during all of the long-range period. However, even under the optimistic assumptions, the DI fund would be exhausted as early as 1997 without corrective legislation.

For each of the next 24 years, OASDI income from payroll taxes and income taxes on benefits is expected to exceed total expenditures based on the intermediate assumptions. Starting about 15 to 20 years from now, however, OASDI costs as a percentage of taxable payroll are projected to begin increasing rapidly as the "baby-boom" generation reaches retirement age. In contrast, the program's income from payroll taxes and income taxes on benefits will represent a relatively level percentage of taxable payroll.

Therefore, under the intermediate assumptions, the OASDI cost rate is projected to exceed the income rate from 2017 through the end of the projection period, with the shortfall reaching 4.81 percent of taxable payroll by 2067, the end of the 75-year projection period. Based on the less favorable conditions assumed in alternative III, the crossover point would be reached in about 1997, and the shortfall would grow eventually to 13.46 percent of payroll by 2067. With more favorable conditions, such as the alternative I assumptions, the cost rate would exceed the income rate only briefly (2027 through 2037); after 2037, the income rate would exceed the cost rate, reaching a positive balance of 0.57 percent of payroll by the end of the 75-year period.

Although, under the intermediate assumptions, the OASDI annual balances become negative after the first 24 years, the availability of interest earnings, in addition to tax revenues, results in projected trust fund growth (in dollars) that would continue for another 8 years. Because expenditures are estimated to increase at a faster rate than assets, however, OASDI assets would decline relative to annual disbursements, from about 3.0 times to about 2.3 times annual expenditures, during the same time period.

The actuarial balance of the OASDI program as a whole over the next 75 years is a deficit of 1.46 percent of taxable payroll, based on the intermediate assumptions. Because of a number of offsetting changes, this deficit is the same as the deficit shown in the 1992 Annual Report. The deficit represents about 10 percent of the estimated cost rate over the next 75 years, and is therefore larger than the maximum 5-percent level allowed over that period by the test

for close actuarial balance. Furthermore, beginning with the 1993-2037 period, and for all successively longer periods through the full 75-year period, the actuarial balances are deficits that are larger than the maximum levels allowed for close actuarial balance. Thus, the OASDI program is not in close actuarial balance.

Each trust fund, separately, is also out of close actuarial balance. On the basis of the intermediate assumptions, the OASI Trust Fund has an actuarial deficit of 0.97 percent of taxable payroll for the full 75-year valuation period, representing 7.6 percent of the OASI long-range cost rate. The DI Trust Fund's actuarial deficit of 0.49 percent of taxable payroll is much larger relative to the DI long-range cost rate—representing 25 percent of the cost rate.

When the 1992 Annual Report was released in early April of last year, the Board of Trustees made a separate report to the Congress on the unfavorable financial status of the DI Trust Fund, as required under section 709 of the Social Security Act. In December 1992, following a careful analysis of the DI program, the Board sent a letter to the Congress recommending a reallocation of tax rates between the OASI and DI Trust Funds to remedy the estimated financial shortfall in the DI fund in the next few years. Based on the estimates in this Annual Report, the Board is sending a separate letter to the Congress recommending a specific reallocation of the tax rates. Because of the imminent depletion of the DI Trust Fund, the Board recommends prompt enactment of the tax-rate reallocation.

In view of the lack of close actuarial balance in the OASDI program over the next 75 years, extensive study should continue on possible ways of addressing the long-range deficits of the program.