## 2. Long-Range Actuarial Status of the Trust Funds

Historically, the actuarial balance (described earlier in this section) has been used as the principal measure of the actuarial status of the OASDI program. Actuarial balances have traditionally been computed for the 25-year valuation period encompassing 1993-2017, the 50-year valuation period covering 1993-2042, and the entire long-range (75-year) valuation period, 1993-2067.

Beginning with the 1991 Annual Report, actuarial balances have also been computed based on the intermediate (alternative II) assumptions for valuation periods that are 10 years, 11 years, ... , 75 years in length. This series of actuarial balances provides the basis for the test of long-range close actuarial balance, described earlier in this section.

In addition to these actuarial balances, other indicators of the financial condition of the program are shown in this report. One is the series of projected annual balances (that is, the differences between the projected annual income rates and annual cost rates), with particular attention being paid to the level of the annual balances at the end of the long-range period and the time at which the annual balances may change from positive to negative values. Another is the series of projected trust fund ratios, with particular attention being paid to the amount and year of maximum fund ratio accumulation and to the year of exhaustion of the funds. These additional indicators are defined in the introduction to this section.

The estimates are sensitive to changes in the underlying economic and demographic assumptions. The degree of sensitivity, however, varies considerably among the various assumptions. For example, variations in assumed fertility rates have little effect on the estimates for the early years, because almost all of the covered workers and beneficiaries projected for the early years were born prior to the start of the projection period. However, lower fertility rates have large impacts on the actuarial balance in the later years. Variations in economic factors, such as interest rates and increases in wages and prices, have significant effects on the estimates for the short term, as well as for the long term. In general, the degree of confidence that can be placed in the assumptions and estimates is greater for the earlier years than for the later years. Nonetheless, even for the earlier years, the estimates are only an indication of the expected trend

and general range of future program experience. Section II.G contains a more detailed discussion of the effects on the estimates of varying certain economic and demographic assumptions.

Table II.F.13 presents a comparison of the estimated annual income rates and cost rates by trust fund and alternative. As previously mentioned, the annual income rate excludes net interest income, as well as certain other transfers from the general fund of the Treasury. Detailed long-range projections of trust fund operations, in nominal dollar amounts, are shown in appendix III.B.

The projections for OASDI under the intermediate alternative II assumptions show income rates that increase slowly and steadily due to the combination of the flat payroll tax rate and the gradually increasing effect of the taxation of benefits. The pattern followed by the cost rates is much different. Costs as a percent of taxable payroll are projected to be relatively stable for the next 15 years and then to increase rather rapidly for about the next 25 years (through 2035) as the "baby-boom" generation reaches retirement age. Cost rates decline slightly for about the next 5 years as the "baby-boom" generation ages and the relatively small birth cohorts of the late 1970s reach retirement age. Thereafter, cost rates rise steadily, but slowly, reflecting projected increases in life expectancy. The cost rates during the third 25-year subperiod rise to a level exceeding 18 percent of taxable payroll under the intermediate alternative II assumptions. The income rate during the third 25-year subperiod is just over 13 percent of taxable payroll under alternative II.

Projected income rates under alternatives I and III are very similar to those projected for alternative II as they are largely a reflection of the tax rates specified in the law. OASDI combined cost rates for alternatives I and III differ significantly in size from those projected for alternative II, but follow generally similar patterns. For the more optimistic alternative I, cost rates decline somewhat for about the first 15 years, and then rise, reaching the current level around 2018 and a peak of about 13.2 percent of payroll around 2030. Thereafter, cost rates decline gradually, reaching a stable ultimate level of about 12.4 percent of payroll by 2050. For the more pessimistic alternative III, cost rates rise virtually throughout the 75-year period, but at a relatively faster pace during the next 5 years due to the assumed economic recessions, and between 2010 and 2030 because of the aging of the "baby-boom" generation. During the third 25-year subperiod,

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the projected cost rate reaches 25 percent of payroll and continues rising.

The projected pattern of the OASDI annual balances (that is, the difference between the income rates and the cost rates) is important in the analysis of the financial condition of the program. Under the alternative II assumptions the annual balances are positive for 24 years (through 2016) and are negative thereafter. This annual deficit rises rapidly reaching 2 percent of taxable payroll before 2025 and continues rising thereafter, to a level of 4.94 percent of taxable payroll for 2070.

Under alternative I, projected OASDI actuarial balances are positive for over 30 years (through 2026), are then briefly negative (through 2037), and thereafter are positive, reaching a level of over 0.5 percent of payroll by 2070. Under the more pessimistic alternative III, however, the OASDI actuarial balance is projected to be positive for only 4 years (through 1996) and to be negative thereafter, reaching deficits of 3 percent of payroll by 2020, nearly 10 percent by 2050, and nearly 14 percent of payroll in 2070.

**TABLE II.F.13.—COMPARISON OF ESTIMATED INCOME RATES AND COST RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1993-2070**

[As a percentage of taxable payroll]

| Calendar year | OASI | | | DI | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| | Income rate | Cost rate | Balance | Income rate | Cost rate | Balance | Income rate | Cost rate | Balance |
| Alternative I: | | | | | | | | | |
| 1993.... | 11.42 | 10.19 | 1.23 | 1.21 | 1.29 | -0.08 | 12.63 | 11.48 | 1.15 |
| 1994.... | 11.42 | 9.96 | 1.46 | 1.21 | 1.30 | -.09 | 12.63 | 11.26 | 1.37 |
| 1995.... | 11.37 | 9.74 | 1.64 | 1.21 | 1.31 | -.10 | 12.58 | 11.05 | 1.54 |
| 1996.... | 11.41 | 9.56 | 1.85 | 1.21 | 1.32 | -.11 | 12.62 | 10.87 | 1.74 |
| 1997.... | 11.40 | 9.39 | 2.01 | 1.21 | 1.33 | -.12 | 12.61 | 10.72 | 1.89 |
| 1998.... | 11.40 | 9.24 | 2.15 | 1.21 | 1.34 | -.13 | 12.61 | 10.58 | 2.03 |
| 1999.... | 11.39 | 9.12 | 2.27 | 1.21 | 1.35 | -.14 | 12.60 | 10.47 | 2.13 |
| 2000.... | 11.17 | 9.01 | 2.16 | 1.43 | 1.35 | .08 | 12.60 | 10.37 | 2.23 |
| 2001.... | 11.17 | 8.90 | 2.27 | 1.43 | 1.36 | .07 | 12.60 | 10.26 | 2.33 |
| 2002.... | 11.17 | 8.79 | 2.37 | 1.43 | 1.38 | .06 | 12.60 | 10.17 | 2.43 |
| 2005.... | 11.23 | 8.54 | 2.69 | 1.44 | 1.48 | -.04 | 12.67 | 10.02 | 2.65 |
| 2010.... | 11.35 | 8.52 | 2.82 | 1.45 | 1.61 | -.15 | 12.80 | 10.13 | 2.67 |
| 2015.... | 11.43 | 9.25 | 2.18 | 1.46 | 1.59 | -.13 | 12.89 | 10.84 | 2.05 |
| 2020.... | 11.49 | 10.35 | 1.14 | 1.46 | 1.53 | -.07 | 12.94 | 11.87 | 1.07 |
| 2025.... | 11.53 | 11.25 | .28 | 1.46 | 1.52 | -.06 | 12.99 | 12.77 | .22 |
| 2030.... | 11.56 | 11.74 | -.18 | 1.46 | 1.48 | -.02 | 13.01 | 13.21 | -.20 |
| 2035.... | 11.56 | 11.75 | -.19 | 1.45 | 1.42 | .03 | 13.01 | 13.17 | -.16 |
| 2040.... | 11.54 | 11.39 | .15 | 1.45 | 1.40 | .05 | 12.99 | 12.79 | .21 |
| 2045.... | 11.52 | 11.04 | .48 | 1.45 | 1.44 | .02 | 12.98 | 12.48 | .50 |
| 2050.... | 11.51 | 10.88 | .63 | 1.45 | 1.46 | (1) | 12.97 | 12.34 | .63 |
| 2055.... | 11.52 | 10.90 | .61 | 1.46 | 1.47 | -.01 | 12.97 | 12.37 | .60 |
| 2060.... | 11.52 | 10.97 | .55 | 1.45 | 1.46 | (1) | 12.97 | 12.42 | .55 |
| 2065.... | 11.52 | 10.96 | .56 | 1.45 | 1.45 | (1) | 12.97 | 12.41 | .56 |
| 2070.... | 11.52 | 10.93 | .58 | 1.46 | 1.46 | -.01 | 12.97 | 12.39 | .58 |

**TABLE II.F.13.—COMPARISON OF ESTIMATED INCOME RATES AND COST RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1993-2070 (Cont.)**

[As a percentage of taxable payroll]

| Calendar year | OASI | | | DI | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| | Income rate | Cost rate | Balance | Income rate | Cost rate | Balance | Income rate | Cost rate | Balance |
| Alternative II: | | | | | | | | | |
| 1993.... | 11.42 | 10.30 | 1.13 | 1.21 | 1.33 | −0.12 | 12.63 | 11.63 | 1.00 |
| 1994.... | 11.42 | 10.18 | 1.24 | 1.21 | 1.38 | −.17 | 12.63 | 11.56 | 1.07 |
| 1995.... | 11.40 | 10.10 | 1.30 | 1.21 | 1.43 | −.22 | 12.61 | 11.53 | 1.08 |
| 1996.... | 11.42 | 10.06 | 1.36 | 1.21 | 1.48 | −.27 | 12.63 | 11.54 | 1.09 |
| 1997.... | 11.41 | 10.01 | 1.40 | 1.21 | 1.53 | −.32 | 12.63 | 11.55 | 1.08 |
| 1998.... | 11.41 | 9.99 | 1.42 | 1.21 | 1.58 | −.37 | 12.62 | 11.57 | 1.05 |
| 1999.... | 11.41 | 9.96 | 1.45 | 1.21 | 1.63 | −.42 | 12.62 | 11.59 | 1.03 |
| 2000.... | 11.19 | 9.94 | 1.25 | 1.43 | 1.67 | −.24 | 12.62 | 11.61 | 1.02 |
| 2001.... | 11.19 | 9.91 | 1.28 | 1.43 | 1.71 | −.27 | 12.62 | 11.62 | 1.00 |
| 2002.... | 11.19 | 9.87 | 1.31 | 1.43 | 1.74 | −.31 | 12.62 | 11.62 | 1.00 |
| 2005.... | 11.27 | 9.72 | 1.54 | 1.44 | 1.86 | −.42 | 12.71 | 11.58 | 1.13 |
| 2010.... | 11.40 | 9.80 | 1.60 | 1.46 | 1.98 | −.52 | 12.86 | 11.79 | 1.08 |
| 2015.... | 11.50 | 10.69 | .81 | 1.47 | 1.99 | −.52 | 12.97 | 12.68 | .29 |
| 2020.... | 11.57 | 12.07 | −.50 | 1.47 | 1.97 | −.50 | 13.04 | 14.04 | −1.00 |
| 2025.... | 11.63 | 13.36 | −1.72 | 1.47 | 2.00 | −.53 | 13.10 | 15.35 | −2.25 |
| 2030.... | 11.68 | 14.28 | −2.61 | 1.47 | 1.96 | −.50 | 13.15 | 16.25 | −3.10 |
| 2035.... | 11.70 | 14.71 | −3.01 | 1.47 | 1.91 | −.45 | 13.17 | 16.63 | −3.46 |
| 2040.... | 11.70 | 14.69 | −2.99 | 1.47 | 1.91 | −.45 | 13.17 | 16.60 | −3.43 |
| 2045.... | 11.70 | 14.63 | −2.94 | 1.47 | 2.00 | −.53 | 13.17 | 16.63 | −3.47 |
| 2050.... | 11.71 | 14.79 | −3.08 | 1.47 | 2.05 | −.59 | 13.17 | 16.84 | −3.67 |
| 2055.... | 11.72 | 15.17 | −3.45 | 1.47 | 2.09 | −.62 | 13.19 | 17.26 | −4.07 |
| 2060.... | 11.75 | 15.60 | −3.86 | 1.47 | 2.07 | −.60 | 13.22 | 17.67 | −4.46 |
| 2065.... | 11.76 | 15.89 | −4.13 | 1.47 | 2.06 | −.59 | 13.23 | 17.95 | −4.72 |
| 2070.... | 11.77 | 16.10 | −4.33 | 1.47 | 2.08 | −.61 | 13.24 | 18.18 | −4.94 |
| Alternative III: | | | | | | | | | |
| 1993.... | 11.42 | 10.35 | 1.07 | 1.21 | 1.36 | −.15 | 12.63 | 11.71 | .92 |
| 1994.... | 11.43 | 10.49 | .94 | 1.21 | 1.46 | −.25 | 12.64 | 11.96 | .68 |
| 1995.... | 11.45 | 10.55 | .90 | 1.21 | 1.56 | −.35 | 12.66 | 12.11 | .55 |
| 1996.... | 11.43 | 10.55 | .88 | 1.21 | 1.65 | −.44 | 12.64 | 12.20 | .44 |
| 1997.... | 11.43 | 10.92 | .52 | 1.21 | 1.80 | −.59 | 12.65 | 12.72 | −.07 |
| 1998.... | 11.44 | 11.10 | .34 | 1.21 | 1.92 | −.71 | 12.65 | 13.02 | −.37 |
| 1999.... | 11.43 | 11.12 | .32 | 1.22 | 2.01 | −.80 | 12.65 | 13.13 | −.48 |
| 2000.... | 11.21 | 11.09 | .13 | 1.44 | 2.09 | −.66 | 12.65 | 13.18 | −.53 |
| 2001.... | 11.21 | 11.10 | .12 | 1.44 | 2.17 | −.73 | 12.65 | 13.26 | −.61 |
| 2002.... | 11.21 | 11.12 | .09 | 1.44 | 2.24 | −.80 | 12.65 | 13.36 | −.71 |
| 2005.... | 11.31 | 11.07 | .24 | 1.45 | 2.39 | −.94 | 12.76 | 13.46 | −.70 |
| 2010.... | 11.46 | 11.21 | .26 | 1.47 | 2.54 | −1.07 | 12.94 | 13.75 | −.81 |
| 2015.... | 11.58 | 12.20 | −.63 | 1.48 | 2.61 | −1.13 | 13.06 | 14.81 | −1.76 |
| 2020.... | 11.66 | 13.86 | −2.20 | 1.48 | 2.68 | −1.20 | 13.14 | 16.54 | −3.39 |
| 2025.... | 11.74 | 15.56 | −3.82 | 1.49 | 2.79 | −1.30 | 13.23 | 18.35 | −5.12 |
| 2030.... | 11.81 | 17.03 | −5.22 | 1.49 | 2.79 | −1.31 | 13.30 | 19.82 | −6.52 |
| 2035.... | 11.87 | 18.09 | −6.22 | 1.49 | 2.77 | −1.28 | 13.35 | 20.86 | −7.50 |
| 2040.... | 11.90 | 18.70 | −6.80 | 1.49 | 2.82 | −1.33 | 13.38 | 21.52 | −8.13 |
| 2045.... | 11.92 | 19.26 | −7.33 | 1.49 | 2.99 | −1.50 | 13.41 | 22.25 | −8.84 |
| 2050.... | 11.97 | 20.11 | −8.14 | 1.49 | 3.12 | −1.63 | 13.46 | 23.23 | −9.77 |
| 2055.... | 12.02 | 21.29 | −9.26 | 1.50 | 3.21 | −1.71 | 13.52 | 24.50 | −10.98 |
| 2060.... | 12.08 | 22.54 | −10.46 | 1.50 | 3.18 | −1.69 | 13.58 | 25.73 | −12.14 |
| 2065.... | 12.14 | 23.59 | −11.45 | 1.50 | 3.16 | −1.67 | 13.63 | 26.75 | −13.12 |
| 2070.... | 12.18 | 24.44 | −12.27 | 1.50 | 3.18 | −1.68 | 13.67 | 27.62 | −13.95 |

[1]Negligible, i.e., between −0.005 and 0.005 percent of taxable payroll.
Notes:
1. The income rate excludes interest income and certain transfers from the general fund of the Treasury.
2. Totals do not necessarily equal the sums of rounded components.

Summarized values for the full 75-year period are useful in analyzing the long-range financial condition of the program under present law and the long-range financial effects of proposed modifications to the

law. In order to focus on the full 75-year period as well as on broad patterns through the period, table II.F.14 summarizes, on a present-value basis, the projected annual figures presented in the previous table for various periods within the overall 75-year projection period.

Table II.F.14 first shows rates on a present-value basis summarized for each of the 25-year subperiods, excluding both the funds on hand at the beginning of the period and the cost of reaching a trust fund target by the end of the period. These rates are useful for comparing the cash flows of tax income and expenditures, as an indicator of the degree to which tax income during the period is sufficient to meet the outgo estimated for the period.

The table also shows summarized rates including the funds on hand at the start of the period and the cost of reaching a target trust fund balance equal to 100 percent of annual expenditures by the end of the period, for valuation periods of the first 25 years, the first 50 years, and the entire 75-year period. Therefore, the actuarial balance for each of these three valuation periods is equal to the difference between the summarized income rate and cost rate for the corresponding period. A balance of zero for any period on this basis would indicate that estimated outgo for the period could be met, on the average, with a remaining trust fund balance at the end of the period equal to 100 percent of the following year's outgo.

The values in table II.F.14 show that the combined OASDI program is expected to operate with a positive balance over shorter valuation periods under alternatives I and II. For the first-25-year valuation period the summarizing values indicate balances of 2.28 percent of taxable payroll under alternative I, 0.95 percent under alternative II, and −0.66 percent under alternative III. Thus, the program is more than adequately financed for the next 25-year valuation period under all but the more pessimistic alternative III projections. Over the 50-year valuation period, 1993-2042, the OASDI program would have a positive balance of 1.36 percent under alternative I but would have deficits of 0.62 percent under alternative II and 3.07 percent under alternative III. Thus, the program is more than adequately financed for the next 50-year valuation period under only the more optimistic set of assumptions, alternative I.

For the entire 75-year valuation period, the combined OASDI program would again have actuarial deficits except for the more op-

timistic set of assumptions, alternative I. The actuarial balance for this long-range valuation period is projected to be 1.16 percent of taxable payroll under alternative I, −1.46 percent under alternative II, and −4.96 percent under alternative III.

TABLE II.F.14.—COMPARISON OF SUMMARIZED INCOME RATES AND COST RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1993-2067

[As a percentage of taxable payroll]

| Calendar year period | OASI | | | DI | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| | Income rate | Cost rate | Balance | Income rate | Cost rate | Balance | Income rate | Cost rate | Balance |
| **Alternative I:** | | | | | | | | | |
| 25-year subperiods:[1] | | | | | | | | | |
| 1993-2017 ... | 11.31 | 9.06 | 2.25 | 1.37 | 1.47 | −0.09 | 12.68 | 10.53 | 2.15 |
| 2018-2042 ... | 11.52 | 11.28 | .23 | 1.45 | 1.48 | −.02 | 12.97 | 12.76 | .21 |
| 2043-2067 ... | 11.50 | 10.98 | .52 | 1.45 | 1.46 | ([3]) | 12.96 | 12.44 | .52 |
| Valuation periods:[2] | | | | | | | | | |
| 25-year: | | | | | | | | | |
| 1993-2017 . | 11.84 | 9.43 | 2.41 | 1.39 | 1.53 | −.13 | 13.24 | 10.96 | 2.28 |
| 50-year: | | | | | | | | | |
| 1993-2042 . | 11.70 | 10.26 | 1.44 | 1.42 | 1.50 | −.07 | 13.12 | 11.75 | 1.36 |
| 75-year: | | | | | | | | | |
| 1993-2067 . | 11.64 | 10.43 | 1.21 | 1.43 | 1.48 | −.05 | 13.07 | 11.91 | ·1.16 |
| **Alternative II:** | | | | | | | | | |
| 25-year subperiods:[1] | | | | | | | | | |
| 1993-2017 ... | 11.35 | 10.09 | 1.26 | 1.38 | 1.78 | −.40 | 12.72 | 11.87 | .86 |
| 2018-2042 ... | 11.64 | 13.77 | −2.13 | 1.46 | 1.96 | −.50 | 13.10 | 15.73 | −2.63 |
| 2043-2067 ... | 11.71 | 15.22 | −3.51 | 1.47 | 2.06 | −.59 | 13.18 | 17.28 | −4.10 |
| Valuation periods:[2] | | | | | | | | | |
| 25-year: | | | | | | | | | |
| 1993-2017 . | 11.91 | 10.52 | 1.40 | 1.40 | 1.85 | −.45 | 13.31 | 12.37 | .95 |
| 50-year: | | | | | | | | | |
| 1993-2042 . | 11.79 | 11.95 | −.16 | 1.43 | 1.89 | −.46 | 13.22 | 13.84 | −.62 |
| 75-year: | | | | | | | | | |
| 1993-2067 . | 11.77 | 12.74 | −.97 | 1.44 | 1.93 | −.49 | 13.21 | 14.67 | −1.46 |
| **Alternative III:** | | | | | | | | | |
| 25-year subperiods:[1] | | | | | | | | | |
| 1993-2017 ... | 11.39 | 11.24 | .15 | 1.38 | 2.21 | −.83 | 12.77 | 13.46 | −.69 |
| 2018-2042 ... | 11.77 | 16.54 | −4.77 | 1.48 | 2.78 | −1.29 | 13.26 | 19.32 | −6.07 |
| 2043-2067 ... | 12.00 | 21.25 | −9.25 | 1.49 | 3.14 | −1.64 | 13.50 | 24.39 | −10.89 |
| Valuation periods:[2] | | | | | | | | | |
| 25-year: | | | | | | | | | |
| 1993-2017 . | 11.98 | 11.73 | .25 | 1.40 | 2.31 | −.91 | 13.39 | 14.04 | −.66 |
| 50-year: | | | | | | | | | |
| 1993-2042 . | 11.89 | 13.89 | −2.00 | 1.44 | 2.51 | −1.07 | 13.33 | 16.40 | −3.07 |
| 75-year: | | | | | | | | | |
| 1993-2067 . | 11.92 | 15.68 | −3.76 | 1.45 | 2.66 | −1.20 | 13.37 | 18.33 | −4.96 |

[1]Income rates do not include beginning trust fund balances and cost rates do not include the cost of reaching ending fund targets.

[2]Income rates include beginning trust fund balances and cost rates include the cost of reaching an ending fund target equal to 100 percent of annual expenditures by the end of the period.

[3]Negligible, i.e., between −0.005 and 0.005 percent of taxable payroll.

Note: Totals do not necessarily equal the sums of rounded components.

Also of interest are the long-range financial conditions of the separate OASI and DI programs. As may be concluded from tables II.F.13 and II.F.14, the DI program is in very poor financial condition. The DI program has estimated deficits for every period shown under alternatives I, II, and III. The OASI program also has long-range deficits, but they occur later in the long-range period and they are smaller, relative to program costs.

Annual net cash flow under alternative II, as represented by the balances in table II.F.13, remains positive for 26 years for the OASI program, but is negative in every year for DI, by increasingly large amounts. The relatively less-adequate financing for DI is evident as well in the estimates based on alternatives I and III.

Figure II.F.3 shows in graphical form the patterns of the OASDI annual income rates and cost rates. The income rates are shown only for alternative II in order to simplify the graphical presentation and because, as shown in table II.F.13, the variation in the income rates by alternative is very small. The OASDI long-range summarized income rates for alternatives I and III, for the 75-year valuation period, differ by only 0.30 percent of taxable payroll. By 2070, the annual income rates under alternatives I and III differ by only 0.70 percent of taxable payroll. Only small fluctuations are projected in the income rate, as the rate of income from taxation of benefits varies only slightly, for each alternative, reflecting changes in the cost rate and the fact that benefit-taxation threshold amounts are not indexed.

The patterns of the annual balances are indicated in figure II.F.3. For each alternative, the magnitude of each of the positive balances in the early years, as a percent of taxable payroll, is represented by the distance between the appropriate cost-rate curve and the income-rate curve above it. The magnitude of each of the deficits in subsequent years is represented by the distance between the appropriate cost-rate curve and the income-rate curve below it.

In the future, the cost of the OASDI program, as a percent of taxable payroll, will not necessarily be within the range encompassed by alternatives I and III. Nonetheless, because alternatives I and III define a reasonably wide range of economic and demographic conditions, the resulting estimates delineate a reasonable range for future program costs.

FIGURE II.F.3.—ESTIMATED OASDI INCOME RATES AND COST RATES BY
ALTERNATIVE, CALENDAR YEARS 1983-2070

[As a percentage of taxable payroll]
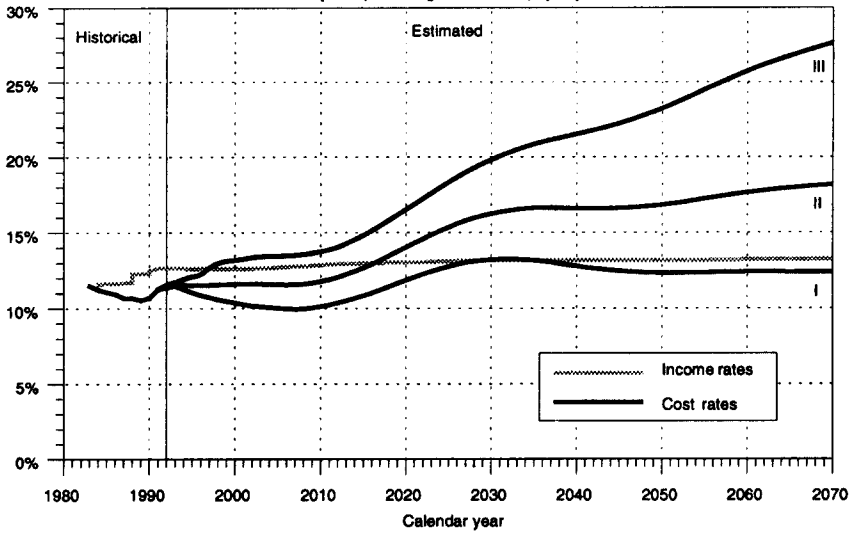
*Actuarial Analysis*

Two tests of the financial status of the OASI, DI, and combined OASDI programs are presented in this report. The test of long-range close actuarial balance incorporates a graduated tolerance scale which allows larger actuarial deficits for longer valuation periods, reflecting the greater uncertainty inherent in the estimates for later years. The other test, the short-range test of the financial adequacy of the program, was discussed earlier in this section.

Table II.F.15 presents a comparison of the estimated actuarial balances with the minimum allowable balance (or maximum allowable deficit) under the long-range test, each expressed as a percentage of the summarized cost rate, based on the intermediate alternative II estimates. Values are shown for only 14 of the valuation periods—those of length 10 years, 15 years, 20 years, ... , and 75 years—although each of the 66 periods—those of length 10 years, 11 years, 12 years, ... , and 75 years—is considered for the test. These minimum allowable balances are calculated to show the limit for each valuation period resulting from the graduated tolerance scale. The patterns in the estimated balances as a percentage of the summarized cost rates as well as that for the minimum allowable balance are presented graphically in figure II.F.4, for the OASI, DI and combined OASDI programs. Values shown for the 25-year, 50-year, and 75-year valuation periods correspond to those presented in table II.F.14.

As discussed earlier, a program is found not to be in long-range close actuarial balance if, for any of the valuation periods ending with the 10th through 75th years of the projection period, the estimated actuarial balance is less than the minimum allowable balance. The minimum allowable balance as a percentage of the summarized cost rate is –5.0 percent for the full 75-year long-range period and is reduced uniformly for shorter valuation periods, reaching zero for the 10-year valuation period.

For the OASI program, the estimated actuarial balance as a percentage of the summarized cost rate exceeds the minimum allowable for valuation periods of length 10 years through 58 years, under the intermediate alternative II estimates. For valuation periods of length greater than 58 years, the estimated actuarial balance is less than the minimum allowable. The shortfall rises gradually, reaching 2.63 percent of the summarized cost rate for the full long-range period. Thus, although the OASI program satisfies the short-range test of financial adequacy (as discussed earlier in this section), it is not in

long-range close actuarial balance.

For the DI program, the estimated actuarial balance as a percentage of the summarized cost rate is less than the minimum allowable balance for each of the 66 separate valuation periods. The shortfall declines from 23.28 percent of the summarized cost rate for the 10-year valuation period to a level of 20.41 percent of the summarized cost rate for the full long-range period. Thus, the DI program is out of long-range close actuarial balance, in addition to the fact that it does not satisfy the short-range test of financial adequacy (as discussed earlier in this section).

For the combined OASDI program, the estimated actuarial balance as a percentage of the summarized cost rate exceeds the minimum allowable balance for valuation periods of length 10 years through 44 years. For valuation periods of length greater than 44 years, the estimated actuarial balance is below the minimum allowable balance. The size of the shortfall rises gradually reaching 4.96 percent of the summarized cost rate for the full 75-year long-range valuation period. Thus, although the OASDI program satisfies the short-range test of financial adequacy (as discussed earlier in this section), it is out of long-range close actuarial balance.

The OASI and DI programs, both separate and combined were also found to be out of close actuarial balance in the 1992 Annual Report. The size and timing of estimated deficits for the combined OASDI program is about the same as shown in the 1992 report. The size of estimated deficits is slightly less for the OASI program in this report. However, for the DI program, the size of the estimated deficits, and therefore the degree to which the program is found to be out of close actuarial balance, is greater based on the estimates presented in this report.

**TABLE II.F.15.—COMPARISON OF ESTIMATED LONG-RANGE ACTUARIAL BAL-
ANCES WITH THE MINIMUM ALLOWABLE FOR THE TEST FOR CLOSE ACTUARIAL
BALANCE BY TRUST FUND, BASED ON ALTERNATIVE II**

| Valuation period | Rates (percentage of taxable payroll) | | | Balance as a percentage of cost rate | |
|---|---|---|---|---|---|
| | Summarized income rate | Summarized cost rate | Balance | Balance | Minimum allowable balance |
| **OASI:** | | | | | |
| 10 years: 1993-2002 . . . | 12.65 | 11.03 | 1.63 | 14.74 | 0.00 |
| 15 years: 1993-2007 . . . | 12.20 | 10.60 | 1.61 | 15.18 | −.38 |
| 20 years: 1993-2012 . . . | 12.01 | 10.43 | 1.58 | 15.13 | −.77 |
| 25 years: 1993-2017 . . . | 11.91 | 10.52 | 1.40 | 13.29 | −1.15 |
| 30 years: 1993-2022 . . . | 11.86 | 10.77 | 1.09 | 10.09 | −1.54 |
| 35 years: 1993-2027 . . . | 11.83 | 11.10 | .73 | 6.53 | −1.92 |
| 40 years: 1993-2032 . . . | 11.81 | 11.44 | .37 | 3.26 | −2.31 |
| 45 years: 1993-2037 . . . | 11.80 | 11.73 | .07 | .63 | −2.69 |
| 50 years: 1993-2042 . . . | 11.79 | 11.95 | −.16 | −1.34 | −3.08 |
| 55 years: 1993-2047 . . . | 11.78 | 12.13 | −.35 | −2.87 | −3.46 |
| 60 years: 1993-2052 . . . | 11.78 | 12.29 | −.51 | −4.18 | −3.85 |
| 65 years: 1993-2057 . . . | 11.77 | 12.45 | −.67 | −5.41 | −4.23 |
| 70 years: 1993-2062 . . . | 11.77 | 12.60 | −.83 | −6.57 | −4.62 |
| 75 years: 1993-2067 . . . | 11.77 | 12.74 | −.97 | −7.63 | −5.00 |
| **DI:** | | | | | |
| 10 years: 1993-2002 . . . | 1.32 | 1.72 | −.40 | −23.28 | .00 |
| 15 years: 1993-2007 . . . | 1.36 | 1.77 | −.41 | −23.37 | −.38 |
| 20 years: 1993-2012 . . . | 1.38 | 1.82 | −.44 | −24.13 | −.77 |
| 25 years: 1993-2017 . . . | 1.40 | 1.85 | −.45 | −24.45 | −1.15 |
| 30 years: 1993-2022 . . . | 1.41 | 1.87 | −.46 | −24.55 | −1.54 |
| 35 years: 1993-2027 . . . | 1.42 | 1.88 | −.47 | −24.76 | −1.92 |
| 40 years: 1993-2032 . . . | 1.42 | 1.89 | −.47 | −24.70 | −2.31 |
| 45 years: 1993-2037 . . . | 1.42 | 1.89 | −.46 | −24.54 | −2.69 |
| 50 years: 1993-2042 . . . | 1.43 | 1.89 | −.46 | −24.46 | −3.08 |
| 55 years: 1993-2047 . . . | 1.43 | 1.90 | −.47 | −24.61 | −3.46 |
| 60 years: 1993-2052 . . . | 1.43 | 1.91 | −.47 | −24.85 | −3.85 |
| 65 years: 1993-2057 . . . | 1.43 | 1.92 | −.48 | −25.10 | −4.23 |
| 70 years: 1993-2062 . . . | 1.44 | 1.92 | −.49 | −25.27 | −4.62 |
| 75 years: 1993-2067 . . . | 1.44 | 1.93 | −.49 | −25.41 | −5.00 |
| **OASDI:** | | | | | |
| 10 years: 1993-2002 . . . | 13.97 | 12.75 | 1.22 | 9.60 | .00 |
| 15 years: 1993-2007 . . . | 13.56 | 12.37 | 1.19 | 9.65 | −.38 |
| 20 years: 1993-2012 . . . | 13.39 | 12.26 | 1.14 | 9.29 | −.77 |
| 25 years: 1993-2017 . . . | 13.31 | 12.37 | .95 | 7.65 | −1.15 |
| 30 years: 1993-2022 . . . | 13.27 | 12.64 | .63 | 4.97 | −1.54 |
| 35 years: 1993-2027 . . . | 13.25 | 12.99 | .26 | 2.00 | −1.92 |
| 40 years: 1993-2032 . . . | 13.23 | 13.33 | −.09 | −.70 | −2.31 |
| 45 years: 1993-2037 . . . | 13.23 | 13.61 | −.39 | −2.86 | −2.69 |
| 50 years: 1993-2042 . . . | 13.22 | 13.84 | −.62 | −4.50 | −3.08 |
| 55 years: 1993-2047 . . . | 13.21 | 14.03 | −.81 | −5.81 | −3.46 |
| 60 years: 1993-2052 . . . | 13.21 | 14.20 | −.99 | −6.96 | −3.85 |
| 65 years: 1993-2057 . . . | 13.21 | 14.36 | −1.15 | −8.04 | −4.23 |
| 70 years: 1993-2062 . . . | 13.21 | 14.52 | −1.31 | −9.05 | −4.62 |
| 75 years: 1993-2067 . . . | 13.21 | 14.67 | −1.46 | −9.96 | −5.00 |

FIGURE II.F.4.—COMPARISON OF ESTIMATED LONG-RANGE ACTUARIAL
BALANCES WITH THE MINIMUM ALLOWABLE FOR CLOSE ACTUARIAL
BALANCE, ALTERNATIVE II BY TRUST FUND



Ending year of valuation period
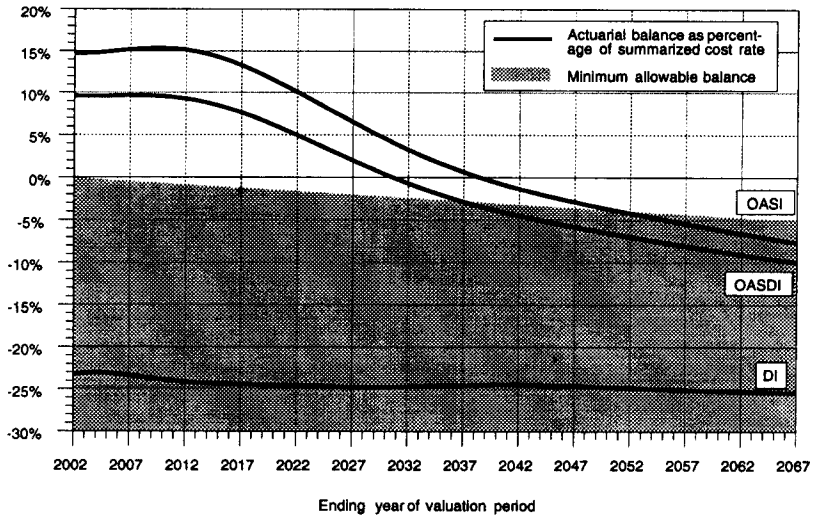
Annual income rates and their components are shown in table II.F.16,
for each alternative set of assumptions. The annual income rates
reflect the scheduled payroll tax rates and the projected rates of
income from the taxation of benefits, which reflect changes in the
cost rates and the fact that benefit-taxation threshold amounts are
not indexed.

Summarized values for the annual income and cost rates, along with
their components, are presented in table II.F.17 for 25-year, 50-year,
and 75-year valuation periods. Summarized income rates include the
starting trust fund balance in addition to the components included
in the annual income rates. The summarized cost rates include the
cost of reaching and maintaining an ending trust fund target of 100
percent of annual expenditures by the end of the period in addition
to the expenditures included in the annual cost rates. Thus, the total
summarized rates shown in table II.F.17 are the same as the sum-
marized income and cost rates shown in table II.F.14 for the 25-year,
50-year, and 75-year valuation periods.

It may be noted that the payroll tax income expressed as a percentage
of taxable payroll is slightly smaller than the actual tax rates in
effect for each period. This results from the fact that all OASDI

income and outgo amounts presented in this report are computed on a cash basis, i.e., amounts are attributed to the year in which they are actually received by, or expended from, the fund, while taxable payroll is allocated to the year in which earnings are paid. Because earnings are paid to workers before the corresponding payroll taxes are credited to the funds, payroll tax income for a particular year reflects a combination of the taxable payrolls from that year and from prior years, when payroll was smaller. Dividing payroll tax income by taxable payroll for a particular year, or period of years, will thus generally result in an income rate that is slightly less than the applicable tax rate for the period.

**TABLE II.F.16.—COMPONENTS OF ANNUAL INCOME RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1993-2070**

[As a percentage of taxable payroll]

| Calendar year | OASI Payroll tax | OASI Taxation of benefits | OASI Total | DI Payroll tax | DI Taxation of benefits | DI Total | Combined Payroll tax | Combined Taxation of benefits | Combined Total |
|---|---|---|---|---|---|---|---|---|---|
| Alternative I: | | | | | | | | | |
| 1993 | 11.20 | 0.22 | 11.42 | 1.20 | 0.01 | 1.21 | 12.40 | 0.23 | 12.63 |
| 1994 | 11.20 | .22 | 11.42 | 1.20 | .01 | 1.21 | 12.40 | .23 | 12.63 |
| 1995 | 11.20 | .17 | 11.37 | 1.20 | .01 | 1.21 | 12.40 | .18 | 12.58 |
| 1996 | 11.20 | .21 | 11.41 | 1.20 | .01 | 1.21 | 12.40 | .22 | 12.62 |
| 1997 | 11.20 | .20 | 11.40 | 1.20 | .01 | 1.21 | 12.40 | .21 | 12.61 |
| 1998 | 11.20 | .20 | 11.40 | 1.20 | .01 | 1.21 | 12.40 | .21 | 12.61 |
| 1999 | 11.20 | .19 | 11.39 | 1.20 | .01 | 1.21 | 12.40 | .20 | 12.60 |
| 2000 | 10.98 | .19 | 11.17 | 1.42 | .01 | 1.43 | 12.40 | .20 | 12.60 |
| 2001 | 10.98 | .19 | 11.17 | 1.42 | .01 | 1.43 | 12.40 | .20 | 12.60 |
| 2002 | 10.98 | .19 | 11.17 | 1.42 | .01 | 1.43 | 12.40 | .20 | 12.60 |
| 2005 | 10.98 | .25 | 11.23 | 1.42 | .02 | 1.44 | 12.40 | .27 | 12.67 |
| 2010 | 10.98 | .37 | 11.35 | 1.42 | .03 | 1.45 | 12.40 | .40 | 12.80 |
| 2015 | 10.98 | .45 | 11.43 | 1.42 | .04 | 1.46 | 12.40 | .49 | 12.89 |
| 2020 | 10.98 | .51 | 11.49 | 1.42 | .04 | 1.46 | 12.40 | .54 | 12.94 |
| 2025 | 10.98 | .55 | 11.53 | 1.42 | .04 | 1.46 | 12.40 | .59 | 12.99 |
| 2030 | 10.98 | .58 | 11.56 | 1.42 | .04 | 1.46 | 12.40 | .61 | 13.01 |
| 2035 | 10.98 | .58 | 11.56 | 1.42 | .03 | 1.45 | 12.40 | .61 | 13.01 |
| 2040 | 10.98 | .56 | 11.54 | 1.42 | .03 | 1.45 | 12.40 | .59 | 12.99 |
| 2045 | 10.98 | .54 | 11.52 | 1.42 | .03 | 1.45 | 12.40 | .58 | 12.98 |
| 2050 | 10.98 | .53 | 11.51 | 1.42 | .03 | 1.45 | 12.40 | .57 | 12.97 |
| 2055 | 10.98 | .54 | 11.52 | 1.42 | .04 | 1.46 | 12.40 | .57 | 12.97 |
| 2060 | 10.98 | .54 | 11.52 | 1.42 | .03 | 1.45 | 12.40 | .57 | 12.97 |
| 2065 | 10.98 | .54 | 11.52 | 1.42 | .03 | 1.45 | 12.40 | .57 | 12.97 |
| 2070 | 10.98 | .54 | 11.52 | 1.42 | .04 | 1.46 | 12.40 | .57 | 12.97 |

**TABLE II.F.16.—COMPONENTS OF ANNUAL INCOME RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1993-2070 (Cont.)**

[As a percentage of taxable payroll]

| Calendar year | OASI Payroll tax | OASI Taxation of benefits | OASI Total | DI Payroll tax | DI Taxation of benefits | DI Total | Combined Payroll tax | Combined Taxation of benefits | Combined Total |
|---|---|---|---|---|---|---|---|---|---|
| **Alternative II:** | | | | | | | | | |
| 1993 . . . . . . | 11.20 | 0.22 | 11.42 | 1.20 | 0.01 | 1.21 | 12.40 | 0.23 | 12.63 |
| 1994 . . . . . . | 11.20 | .22 | 11.42 | 1.20 | .01 | 1.21 | 12.40 | .23 | 12.63 |
| 1995 . . . . . . | 11.20 | .20 | 11.40 | 1.20 | .01 | 1.21 | 12.40 | .21 | 12.61 |
| 1996 . . . . . . | 11.20 | .22 | 11.42 | 1.20 | .01 | 1.21 | 12.40 | .23 | 12.63 |
| 1997 . . . . . . | 11.20 | .21 | 11.41 | 1.20 | .01 | 1.21 | 12.40 | .23 | 12.63 |
| 1998 . . . . . . | 11.20 | .21 | 11.41 | 1.20 | .01 | 1.21 | 12.40 | .22 | 12.62 |
| 1999 . . . . . . | 11.20 | .21 | 11.41 | 1.20 | .01 | 1.21 | 12.40 | .22 | 12.62 |
| 2000 . . . . . . | 10.98 | .21 | 11.19 | 1.42 | .01 | 1.43 | 12.40 | .22 | 12.62 |
| 2001 . . . . . . | 10.98 | .21 | 11.19 | 1.42 | .01 | 1.43 | 12.40 | .22 | 12.62 |
| 2002 . . . . . . | 10.98 | .21 | 11.19 | 1.42 | .01 | 1.43 | 12.40 | .22 | 12.62 |
| 2005 . . . . . . | 10.98 | .29 | 11.27 | 1.42 | .02 | 1.44 | 12.40 | .31 | 12.71 |
| 2010 . . . . . . | 10.98 | .42 | 11.40 | 1.42 | .04 | 1.46 | 12.40 | .46 | 12.86 |
| 2015 . . . . . . | 10.98 | .52 | 11.50 | 1.42 | .05 | 1.47 | 12.40 | .57 | 12.97 |
| 2020 . . . . . . | 10.98 | .59 | 11.57 | 1.42 | .05 | 1.47 | 12.40 | .64 | 13.04 |
| 2025 . . . . . . | 10.98 | .65 | 11.63 | 1.42 | .05 | 1.47 | 12.40 | .70 | 13.10 |
| 2030 . . . . . . | 10.98 | .70 | 11.68 | 1.42 | .05 | 1.47 | 12.40 | .75 | 13.15 |
| 2035 . . . . . . | 10.98 | .72 | 11.70 | 1.42 | .05 | 1.47 | 12.40 | .77 | 13.17 |
| 2040 . . . . . . | 10.98 | .72 | 11.70 | 1.42 | .05 | 1.47 | 12.40 | .77 | 13.17 |
| 2045 . . . . . . | 10.98 | .72 | 11.70 | 1.42 | .05 | 1.47 | 12.40 | .77 | 13.17 |
| 2050 . . . . . . | 10.98 | .73 | 11.71 | 1.42 | .05 | 1.47 | 12.40 | .77 | 13.17 |
| 2055 . . . . . . | 10.98 | .74 | 11.72 | 1.42 | .05 | 1.47 | 12.40 | .79 | 13.19 |
| 2060 . . . . . . | 10.98 | .77 | 11.75 | 1.42 | .05 | 1.47 | 12.40 | .82 | 13.22 |
| 2065 . . . . . . | 10.98 | .78 | 11.76 | 1.42 | .05 | 1.47 | 12.40 | .83 | 13.23 |
| 2070 . . . . . . | 10.98 | .79 | 11.77 | 1.42 | .05 | 1.47 | 12.40 | .84 | 13.24 |
| **Alternative III:** | | | | | | | | | |
| 1993 . . . . . . | 11.20 | .22 | 11.42 | 1.20 | .01 | 1.21 | 12.40 | .23 | 12.63 |
| 1994 . . . . . . | 11.20 | .23 | 11.43 | 1.20 | .01 | 1.21 | 12.40 | .24 | 12.64 |
| 1995 . . . . . . | 11.20 | .25 | 11.45 | 1.20 | .01 | 1.21 | 12.40 | .26 | 12.66 |
| 1996 . . . . . . | 11.20 | .23 | 11.43 | 1.20 | .01 | 1.21 | 12.40 | .24 | 12.64 |
| 1997 . . . . . . | 11.20 | .23 | 11.43 | 1.20 | .01 | 1.21 | 12.40 | .25 | 12.65 |
| 1998 . . . . . . | 11.20 | .24 | 11.44 | 1.20 | .01 | 1.21 | 12.40 | .25 | 12.65 |
| 1999 . . . . . . | 11.20 | .23 | 11.43 | 1.20 | .02 | 1.22 | 12.40 | .25 | 12.65 |
| 2000 . . . . . . | 10.98 | .23 | 11.21 | 1.42 | .02 | 1.44 | 12.40 | .25 | 12.65 |
| 2001 . . . . . . | 10.98 | .23 | 11.21 | 1.42 | .02 | 1.44 | 12.40 | .25 | 12.65 |
| 2002 . . . . . . | 10.98 | .23 | 11.21 | 1.42 | .02 | 1.44 | 12.40 | .25 | 12.65 |
| 2005 . . . . . . | 10.98 | .33 | 11.31 | 1.42 | .03 | 1.45 | 12.40 | .36 | 12.76 |
| 2010 . . . . . . | 10.98 | .48 | 11.46 | 1.42 | .05 | 1.47 | 12.40 | .54 | 12.94 |
| 2015 . . . . . . | 10.98 | .60 | 11.58 | 1.42 | .06 | 1.48 | 12.40 | .66 | 13.06 |
| 2020 . . . . . . | 10.98 | .68 | 11.66 | 1.42 | .06 | 1.48 | 12.40 | .74 | 13.14 |
| 2025 . . . . . . | 10.98 | .76 | 11.74 | 1.42 | .07 | 1.49 | 12.40 | .83 | 13.23 |
| 2030 . . . . . . | 10.98 | .83 | 11.81 | 1.42 | .07 | 1.49 | 12.40 | .90 | 13.30 |
| 2035 . . . . . . | 10.98 | .89 | 11.87 | 1.42 | .07 | 1.49 | 12.40 | .95 | 13.35 |
| 2040 . . . . . . | 10.98 | .92 | 11.90 | 1.42 | .07 | 1.49 | 12.40 | .98 | 13.38 |
| 2045 . . . . . . | 10.98 | .94 | 11.92 | 1.42 | .07 | 1.49 | 12.40 | 1.01 | 13.41 |
| 2050 . . . . . . | 10.98 | .99 | 11.97 | 1.42 | .07 | 1.49 | 12.40 | 1.06 | 13.46 |
| 2055 . . . . . . | 10.98 | 1.04 | 12.02 | 1.42 | .08 | 1.50 | 12.40 | 1.12 | 13.52 |
| 2060 . . . . . . | 10.98 | 1.10 | 12.08 | 1.42 | .08 | 1.50 | 12.40 | 1.18 | 13.58 |
| 2065 . . . . . . | 10.98 | 1.16 | 12.14 | 1.42 | .08 | 1.50 | 12.40 | 1.23 | 13.63 |
| 2070 . . . . . . | 10.98 | 1.20 | 12.18 | 1.42 | .08 | 1.50 | 12.40 | 1.27 | 13.67 |

Note: Totals do not necessarily equal the sums of rounded components.

**TABLE II.F.17.—COMPONENTS OF SUMMARIZED INCOME RATES AND COST RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1993-2067**

[As a percentage of taxable payroll]

| | Income rate | | | | Cost rate | | |
|---|---|---|---|---|---|---|---|
| Valuation period | Payroll tax | Taxation of benefits | Beginning fund balance | Total | Disburse-ments | Ending fund target | Total |
| **OASI:** | | | | | | | |
| Alternative I: | | | | | | | |
| 1993-2017............ | 11.02 | 0.29 | 0.53 | 11.84 | 9.06 | 0.37 | 9.43 |
| 1993-2042............ | 10.99 | .41 | .29 | 11.70 | 10.07 | .19 | 10.26 |
| 1993-2067............ | 10.99 | .44 | .21 | 11.64 | 10.32 | .11 | 10.43 |
| Alternative II: | | | | | | | |
| 1993-2017............ | 11.02 | .33 | .57 | 11.91 | 10.09 | .43 | 10.52 |
| 1993-2042............ | 11.00 | .48 | .32 | 11.79 | 11.72 | .23 | 11.95 |
| 1993-2067............ | 10.99 | .55 | .24 | 11.77 | 12.60 | .14 | 12.74 |
| Alternative III: | | | | | | | |
| 1993-2017............ | 11.02 | .37 | .60 | 11.98 | 11.24 | .49 | 11.73 |
| 1993-2042............ | 11.00 | .56 | .33 | 11.89 | 13.59 | .30 | 13.89 |
| 1993-2067............ | 10.99 | .68 | .25 | 11.92 | 15.47 | .20 | 15.68 |
| **DI:** | | | | | | | |
| Alternative I: | | | | | | | |
| 1993-2017............ | 1.35 | .02 | .02 | 1.39 | 1.47 | .06 | 1.53 |
| 1993-2042............ | 1.38 | .03 | .01 | 1.42 | 1.47 | .02 | 1.50 |
| 1993-2067............ | 1.39 | .03 | .01 | 1.43 | 1.47 | .01 | 1.48 |
| Alternative II: | | | | | | | |
| 1993-2017............ | 1.35 | .03 | .02 | 1.40 | 1.78 | .07 | 1.85 |
| 1993-2042............ | 1.38 | .04 | .01 | 1.43 | 1.86 | .03 | 1.89 |
| 1993-2067............ | 1.39 | .04 | .01 | 1.44 | 1.91 | .02 | 1.93 |
| Alternative III: | | | | | | | |
| 1993-2017............ | 1.35 | .03 | .02 | 1.40 | 2.21 | .10 | 2.31 |
| 1993-2042............ | 1.38 | .05 | .01 | 1.44 | 2.46 | .05 | 2.51 |
| 1993-2067............ | 1.39 | .05 | .01 | 1.45 | 2.63 | .03 | 2.66 |
| **OASDI:** | | | | | | | |
| Alternative I: | | | | | | | |
| 1993-2017............ | 12.37 | .31 | .55 | 13.24 | 10.53 | .43 | 10.96 |
| 1993-2042............ | 12.38 | .44 | .30 | 13.12 | 11.54 | .21 | 11.75 |
| 1993-2067............ | 12.38 | .47 | .22 | 13.07 | 11.78 | .13 | 11.91 |
| Alternative II: | | | | | | | |
| 1993-2017............ | 12.37 | .35 | .59 | 13.31 | 11.87 | .50 | 12.37 |
| 1993-2042............ | 12.38 | .51 | .33 | 13.22 | 13.58 | .26 | 13.84 |
| 1993-2067............ | 12.38 | .59 | .25 | 13.21 | 14.51 | .16 | 14.67 |
| Alternative III: | | | | | | | |
| 1993-2017............ | 12.37 | .40 | .62 | 13.39 | 13.46 | .59 | 14.04 |
| 1993-2042............ | 12.37 | .61 | .34 | 13.33 | 16.06 | .35 | 16.40 |
| 1993-2067............ | 12.38 | .73 | .26 | 13.37 | 18.10 | .23 | 18.33 |

Note: Totals do not necessarily equal the sums of rounded components.

The primary reason that the estimated OASDI cost rate increases rapidly after 2010 is that the number of beneficiaries is projected to increase more rapidly than the number of covered workers. This occurs because the relatively large number of persons born during the period of high fertility rates from the end of World War II through the mid-1960s will reach retirement age, and begin to receive benefits, while the relatively small number of persons born during the subsequent period of low fertility rates will comprise the labor force. A comparison of the numbers of covered workers and beneficiaries is shown in table II.F.18.

### TABLE II.F.18.—COMPARISON OF OASDI COVERED WORKERS AND BENEFICIARIES BY ALTERNATIVE, CALENDAR YEARS 1945-2070

| Calendar year | Covered workers [1] (in thousands) | Beneficiaries [2] (in thousands) | | | Covered workers per OASDI beneficiary | Beneficiaries per 100 covered workers |
|---|---|---|---|---|---|---|
| | | OASI | DI | OASDI | | |
| Historical data: | | | | | | |
| 1945......... | 46,390 | 1,106 | — | 1,106 | 41.9 | 2 |
| 1950......... | 48,280 | 2,930 | — | 2,930 | 16.5 | 6 |
| 1955......... | 65,200 | 7,563 | — | 7,563 | 8.6 | 12 |
| 1960......... | 72,530 | 13,740 | 522 | 14,262 | 5.1 | 20 |
| 1965......... | 80,680 | 18,509 | 1,648 | 20,158 | 4.0 | 25 |
| 1970......... | 93,090 | 22,618 | 2,568 | 25,186 | 3.7 | 27 |
| 1975......... | 100,200 | 26,998 | 4,125 | 31,123 | 3.2 | 31 |
| 1980......... | 112,040 | 30,385 | 4,734 | 35,119 | 3.2 | 31 |
| 1985......... | 119,480 | 32,776 | 3,874 | 36,650 | 3.3 | 31 |
| 1986......... | 121,965 | 33,349 | 3,972 | 37,321 | 3.3 | 31 |
| 1987......... | 125,045 | 33,918 | 4,035 | 37,952 | 3.3 | 30 |
| 1988......... | 129,180 | 34,343 | 4,077 | 38,420 | 3.4 | 30 |
| 1989......... | [3]131,714 | 34,754 | 4,105 | 38,859 | 3.4 | 30 |
| 1990......... | [3]132,755 | 35,266 | 4,204 | 39,470 | 3.4 | 30 |
| 1991......... | [3]132,727 | 35,785 | 4,388 | 40,173 | 3.3 | 30 |
| 1992......... | [3]132,857 | 36,314 | 4,716 | 41,029 | 3.2 | 31 |
| Alternative I: | | | | | | |
| 1993......... | 135,246 | 36,807 | 5,050 | 41,857 | 3.2 | 31 |
| 1995......... | 140,465 | 37,569 | 5,573 | 43,142 | 3.3 | 31 |
| 2000......... | 149,547 | 39,108 | 6,464 | 45,573 | 3.3 | 30 |
| 2005......... | 156,629 | 40,523 | 8,191 | 48,714 | 3.2 | 31 |
| 2010......... | 162,620 | 43,294 | 8,719 | 52,013 | 3.1 | 32 |
| 2015......... | 166,628 | 48,652 | 8,598 | 57,250 | 2.9 | 34 |
| 2020......... | 169,666 | 55,511 | 8,315 | 63,826 | 2.7 | 38 |
| 2025......... | 172,827 | 62,076 | 8,355 | 70,431 | 2.5 | 41 |
| 2030......... | 176,881 | 67,016 | 8,264 | 75,280 | 2.3 | 43 |
| 2035......... | 182,082 | 69,883 | 8,161 | 78,044 | 2.3 | 43 |
| 2040......... | 187,632 | 70,526 | 8,259 | 78,785 | 2.4 | 42 |
| 2045......... | 193,056 | 70,936 | 8,681 | 79,617 | 2.4 | 41 |
| 2050......... | 198,522 | 72,027 | 9,027 | 81,054 | 2.4 | 41 |
| 2055......... | 204,235 | 74,150 | 9,355 | 83,505 | 2.4 | 41 |
| 2060......... | 210,377 | 76,607 | 9,556 | 86,163 | 2.4 | 41 |
| 2065......... | 216,746 | 78,838 | 9,818 | 88,656 | 2.4 | 41 |
| 2070......... | 223,151 | 80,998 | 10,169 | 91,167 | 2.4 | 41 |

**TABLE II.F.18.—COMPARISON OF OASDI COVERED WORKERS AND
BENEFICIARIES BY ALTERNATIVE,
CALENDAR YEARS 1945-2070 (Cont.)**

| Calendar year | Covered workers [1] (in thousands) | Beneficiaries[2] (in thousands) | | | Covered workers per OASDI beneficiary | Beneficiaries per 100 covered workers |
|---|---|---|---|---|---|---|
| | | OASI | DI | OASDI | | |
| **Alternative II:** | | | | | | |
| 1993......... | 134,956 | 36,808 | 5,096 | 41,904 | 3.2 | 31 |
| 1995......... | 139,010 | 37,594 | 5,820 | 43,414 | 3.2 | 31 |
| 2000......... | 145,767 | 39,343 | 7,310 | 46,653 | 3.1 | 32 |
| 2005......... | 151,839 | 41,158 | 8,751 | 49,909 | 3.0 | 33 |
| 2010......... | 156,948 | 44,219 | 9,578 | 53,797 | 2.9 | 34 |
| 2015......... | 159,834 | 49,884 | 9,706 | 59,590 | 2.7 | 37 |
| 2020......... | 161,116 | 57,120 | 9,588 | 66,708 | 2.4 | 41 |
| 2025......... | 161,912 | 64,122 | 9,714 | 73,836 | 2.2 | 46 |
| 2030......... | 162,975 | 69,631 | 9,611 | 79,242 | 2.1 | 49 |
| 2035......... | 164,590 | 73,091 | 9,452 | 82,543 | 2.0 | 50 |
| 2040......... | 166,134 | 74,230 | 9,506 | 83,736 | 2.0 | 50 |
| 2045......... | 167,139 | 74,939 | 9,922 | 84,861 | 2.0 | 51 |
| 2050......... | 167,775 | 76,203 | 10,200 | 86,403 | 1.9 | 51 |
| 2055......... | 168,153 | 78,382 | 10,398 | 88,780 | 1.9 | 53 |
| 2060......... | 168,646 | 80,701 | 10,366 | 91,067 | 1.9 | 54 |
| 2065......... | 169,197 | 82,492 | 10,376 | 92,868 | 1.8 | 55 |
| 2070......... | 169,714 | 83,906 | 10,479 | 94,385 | 1.8 | 56 |
| **Alternative III:** | | | | | | |
| 1993......... | 134,732 | 36,811 | 5,132 | 41,944 | 3.2 | 31 |
| 1995......... | 136,372 | 37,631 | 6,043 | 43,674 | 3.1 | 32 |
| 2000......... | 141,958 | 39,595 | 8,343 | 47,938 | 3.0 | 34 |
| 2005......... | 147,184 | 41,820 | 9,649 | 51,469 | 2.9 | 35 |
| 2010......... | 151,330 | 45,132 | 11,004 | 56,136 | 2.7 | 37 |
| 2015......... | 153,302 | 51,057 | 11,616 | 62,673 | 2.4 | 41 |
| 2020......... | 153,108 | 58,660 | 11,866 | 70,526 | 2.2 | 46 |
| 2025......... | 151,907 | 66,132 | 12,226 | 78,358 | 1.9 | 52 |
| 2030......... | 150,523 | 72,389 | 12,169 | 84,558 | 1.8 | 56 |
| 2035......... | 149,156 | 76,778 | 11,970 | 88,748 | 1.7 | 60 |
| 2040......... | 147,389 | 78,852 | 11,984 | 90,836 | 1.6 | 62 |
| 2045......... | 144,885 | 80,314 | 12,420 | 92,734 | 1.6 | 64 |
| 2050......... | 141,680 | 82,218 | 12,604 | 94,822 | 1.5 | 67 |
| 2055......... | 138,074 | 84,878 | 12,608 | 97,486 | 1.4 | 71 |
| 2060......... | 134,495 | 87,449 | 12,213 | 99,662 | 1.3 | 74 |
| 2065......... | 131,050 | 89,106 | 11,850 | 100,956 | 1.3 | 77 |
| 2070......... | 127,693 | 90,004 | 11,615 | 101,619 | 1.3 | 80 |

[1]Workers who are paid at some time during the year for employment on which OASDI taxes are due.
[2]Beneficiaries with monthly benefits in current-payment status as of June 30.
[3]Preliminary.

Note: The numbers of beneficiaries do not include certain uninsured persons, most of whom both attained age 72 before 1968 and have fewer than 3 quarters of coverage, in which cases the costs are reimbursed by the general fund of the Treasury. The number of such uninsured persons was 4,368 as of June 30, 1992, and is estimated to be fewer than 500 by the turn of the century. Totals do not necessarily equal the sums of rounded components.

Table II.F.18 shows that the number of covered workers per beneficiary, which was about 3.2 in 1992, is estimated to decline in the future. Based on alternative I, for which high fertility rates and small reductions in death rates are assumed, the ratio declines to an ultimate level of 2.4 by 2040. Based on alternative III, for which low fertility rates and substantial reductions in death rates are assumed, the decline is much greater, reaching 1.3 workers per beneficiary by

2060. Based on alternative II, the ratio declines to 1.8 workers per beneficiary by 2065, and remains at that level through 2070.

The impact of the demographic shifts under the three alternatives on the OASDI cost rates is better understood by considering the projected number of beneficiaries per 100 workers. As compared to the 1992 level of 31 beneficiaries per 100 covered workers, this ratio is estimated to rise by the year 2070 to significantly higher levels, which are 41 under alternative I, 56 under alternative II, and 80 under alternative III. The significance of these numbers can be seen by comparing figure II.F.3 to figure II.F.5.

FIGURE II.F.5.—RATIOS OF ESTIMATED OASDI BENEFICIARIES PER 100 COVERED WORKERS BY ALTERNATIVE, CALENDAR YEARS 1983-2070
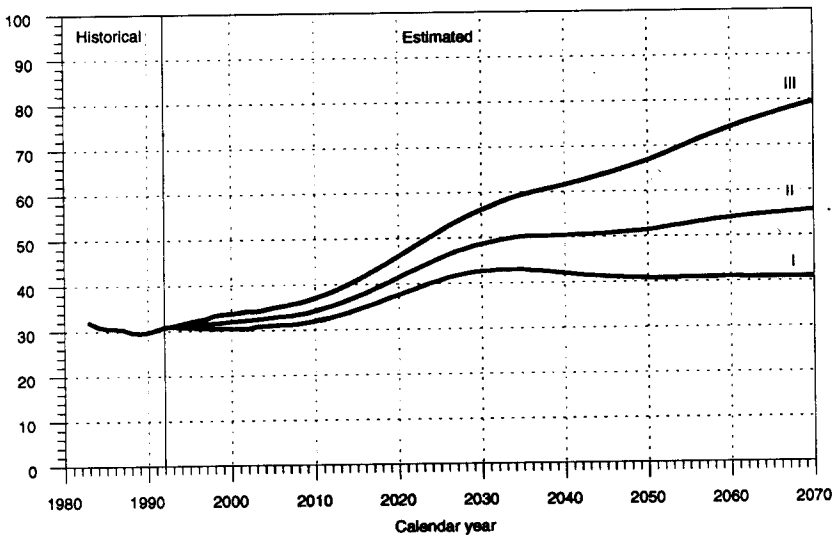


For each alternative, the shape of the curve in figure II.F.5, which shows beneficiaries per 100 covered workers, is strikingly similar to that of the corresponding cost-rate curve in figure II.F.3, thereby emphasizing the extent to which the cost of the OASDI program is determined by the age patterns of the population. Because the cost rate is basically the product of the number of beneficiaries and their average benefit, divided by the product of the number of covered workers and their average taxable earnings (and because average benefits rise at about the same rate as average earnings), it is reasonable that the pattern of the annual cost rates is similar to that

of the annual ratios of beneficiaries to workers. A graphical presentation of covered workers per beneficiary is shown in section I.G of the Overview.

Table II.F.19 shows, by alternative, the estimated trust fund ratios (without regard to advance tax transfers that would be effected after the end of the 10-year, short-range period) for the separate and combined OASI and DI Trust Funds. Also shown in this table is the first year in which a fund is estimated to be exhausted, reflecting the effect of the provision for advance tax transfers. The patterns of the combined fund ratios, over the 75-year period, are shown graphically in figure II.F.6, for all three sets of assumptions.

Based on alternative II, the DI trust fund ratio declines from 35 percent at the beginning of 1993 to 11 percent at the beginning of 1995, during which year the fund becomes depleted. The OASI trust fund ratio rises steadily from 117 percent for 1993, reaching a peak of 432 percent at the beginning of 2016. This increase in the OASI trust fund ratio results from the fact that the annual income rate (excluding interest) exceeds annual outgo for several years (see table II.F.13). Thereafter, the OASI ratio declines steadily, with the OASI Trust Fund becoming exhausted in 2044.

The trust fund ratio for the hypothetical combined OASI and DI Trust Funds rises from 107 percent for 1993 to a peak of 298 percent at the beginning of 2015. Thereafter, the ratio declines, with the combined funds becoming exhausted in 2036.

The trust fund ratio begins to decline in 2015, but annual expenditures do not begin to exceed noninterest income until 2017. Although the dollar amount of assets will continue to rise through 2024, because interest income more than offsets the shortfall in noninterest income, revenue from the general fund of the Treasury will be needed in increasingly large amounts, beginning in 2017, to redeem the trust funds' public-debt obligations due to the cash-flow shortfall. This will differ from the experience of recent years when the trust funds have been net lenders to the general fund. The change in the cash flow between the trust funds and the general fund is expected to have important public policy and economic implications that go well beyond the operation of the OASDI program itself. Discussion of these issues is outside the scope of this report.

Based on alternative I, the trust fund ratio increases virtually throughout the long-range projection period for both the OASI and combined funds, reaching extremely high levels by 2070, of 1,218 and 1,044 percent, respectively. The DI trust fund ratio declines steadily reaching 13 percent at the beginning of 1997, including advance tax transfers, and becomes exhausted by the end of that year. In contrast, under alternative III, the OASI trust fund ratio is estimated to peak at 194 percent in 2011, thereafter declining to fund exhaustion by the end of 2025. The DI Trust Fund is estimated to decline rapidly, becoming depleted in 1995. The combined trust fund ratio is estimated to rise to a peak of 126 percent in 1997, declining thereafter to fund exhaustion by the end of 2017.

Thus, because of the high ultimate cost rates that are projected under all but the most optimistic assumptions, income will eventually need to be increased and/or program costs will need to be reduced in order to prevent the OASI Trust Fund from becoming exhausted. As already indicated, such action will be needed for the DI Trust Fund under even the more optimistic alternative I assumptions.

Even under the more pessimistic assumptions, however, the combined OASI and DI funds on hand plus their estimated future income would be able to cover their combined expenditures for about 24 years into the future (until 2017). Under the alternative II assumptions the combined starting funds plus estimated future income would be able to cover expenditures for about 43 years into the future (until 2036). The program would be able to cover expenditures for the indefinite future under the more optimistic assumptions in alternative I. In the 1991 report, the combined trust funds were projected to be exhausted in 2019 under alternative III and in 2036 under alternative II.

## TABLE II.F.19.—ESTIMATED TRUST FUND RATIOS BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1993-2070

[In percent]

| Calendar year | Alternative I | | | Alternative II | | | Alternative III | | |
|---|---|---|---|---|---|---|---|---|---|
| | OASI | DI | Com-bined | OASI | DI | Com-bined | OASI | DI | Com-bined |
| 1993........... | 117 | 35 | 108 | 117 | 35 | 107 | 116 | 34 | 107 |
| 1994........... | 130 | 27 | 118 | 129 | 24 | 116 | 127 | 21 | 114 |
| 1995........... | 149 | 21 | 134 | 144 | 11 | 128 | 138 | 11 | 121 |
| 1996........... | 169 | 13 | 150 | 160 | (1) | 139 | 147 | (1) | 124 |
| 1997........... | 192 | 13 | 169 | 176 | (1) | 150 | 154 | (1) | 126 |
| 1998........... | 217 | (1) | 189 | 193 | (1) | 161 | 160 | (1) | 126 |
| 1999........... | 244 | (1) | 211 | 209 | (1) | 171 | 164 | (1) | 123 |
| 2000........... | 273 | (1) | 234 | 225 | (1) | 180 | 168 | (1) | 120 |
| 2001........... | 301 | (1) | 259 | 239 | (1) | 190 | 171 | (1) | 116 |
| 2002........... | 331 | (1) | 284 | 254 | (1) | 199 | 173 | (1) | 112 |
| 2005........... | 429 | (1) | 364 | 302 | (1) | 227 | 181 | (1) | 98 |
| 2010........... | 602 | (1) | 500 | 388 | (1) | 276 | 194 | (1) | 71 |
| 2015........... | 716 | (1) | 597 | 431 | (1) | 298 | 181 | (1) | 29 |
| 2020........... | 754 | (1) | 639 | 413 | (1) | 274 | 121 | (1) | (1) |
| 2025........... | 760 | (1) | 649 | 356 | (1) | 214 | 20 | (1) | (1) |
| 2030........... | 760 | (1) | 652 | 275 | (1) | 130 | (1) | (1) | (1) |
| 2035........... | 775 | (1) | 668 | 183 | (1) | 33 | (1) | (1) | (1) |
| 2040........... | 824 | (1) | 710 | 89 | (1) | (1) | (1) | (1) | (1) |
| 2045........... | 893 | (1) | 766 | (1) | (1) | (1) | (1) | (1) | (1) |
| 2050........... | 965 | (1) | 826 | (1) | (1) | (1) | (1) | (1) | (1) |
| 2055........... | 1,028 | (1) | 879 | (1) | (1) | (1) | (1) | (1) | (1) |
| 2060........... | 1,084 | (1) | 929 | (1) | (1) | (1) | (1) | (1) | (1) |
| 2065........... | 1,148 | (1) | 984 | (1) | (1) | (1) | (1) | (1) | (1) |
| 2070........... | 1,218 | (1) | 1,044 | (1) | (1) | (1) | (1) | (1) | (1) |
| Trust fund is estimated to be exhausted in:.... | (2) | 1997 | (2) | 2044 | 1995 | 2036 | 2025 | 1995 | 2017 |

[1]The trust fund is estimated to have been exhausted by the beginning of this year. The last line of the table shows the specific year of trust fund exhaustion.

[2]The fund is not estimated to be exhausted within the projection period.

Note: See Glossary for definition of trust fund ratio. The OASDI ratios shown for years after a given fund is estimated to be exhausted are theoretical and are shown for informational purposes only.

A graphic illustration of the trust fund ratios for the combined trust funds is shown in figure II.F.6 for each of the alternative sets of assumptions.

FIGURE II.F.6.—ESTIMATED TRUST FUND RATIOS, FOR OASI AND DI TRUST FUNDS COMBINED, CALENDAR YEARS 1983-2070
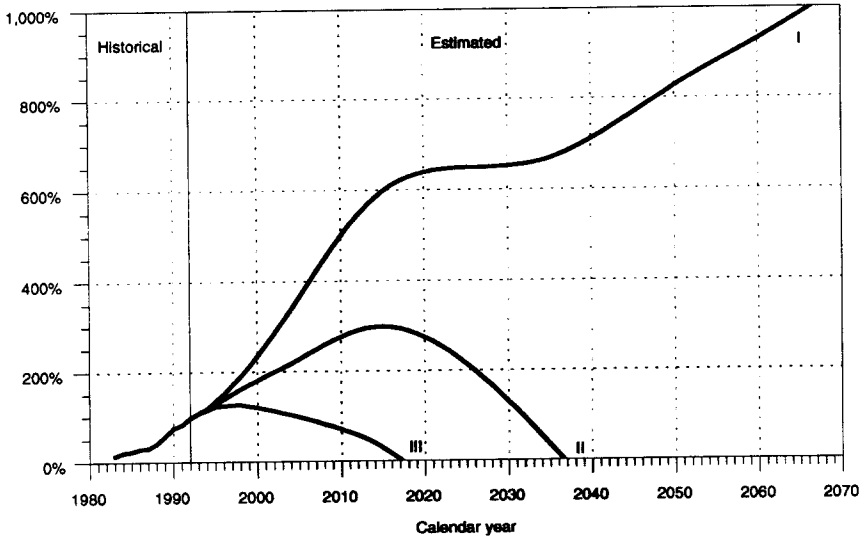
Reasons for changes from last year's report to this report in the long-range actuarial balance under the intermediate assumptions are itemized in table II.F.20. Also shown are the estimated effects associated with each reason for change.

**TABLE II.F.20.—CHANGE IN ACTUARIAL BALANCE ESTIMATED ON THE BASIS OF INTERMEDIATE, ALTERNATIVE II, ESTIMATES BY TRUST FUND AND REASON FOR CHANGE**

[As a percentage of taxable payroll]

| Item | OASI | DI | Combined |
|---|---|---|---|
| Shown in last year's report: | | | |
| Income rate | 11.73 | 1.43 | 13.16 |
| Cost rate | 12.74 | 1.89 | 14.63 |
| Actuarial balance | −1.01 | −.46 | −1.46 |
| Changes in actuarial balance due to changes in: | | | |
| Valuation period | −.05 | −.00 | −.05 |
| Demographic assumptions | +.10 | +.01 | +.11 |
| Economic assumptions | −.01 | −.00 | −.01 |
| Disability assumptions | −.00 | −.08 | −.08 |
| Methods | −.00 | +.03 | +.03 |
| Total change in actuarial balance | +.03 | −.03 | −.00 |
| Shown in this report: | | | |
| Actuarial balance | −.97 | −.49 | −1.46 |
| Income rate | 11.77 | 1.43 | 13.21 |
| Cost rate | 12.74 | 1.93 | 14.67 |

Note: Totals do not necessarily equal the sums of rounded components.

In changing from the valuation period of last year's report, which was 1992-2066, to the valuation period of this report, 1993-2067, the relatively large negative annual balance for the year 2067 is included. This results in a decrease in the long-range actuarial balance. (Note that the positive balance for 1992 is, in effect, retained because the funds accumulated during the year are included in the income rate and the actuarial balance for this year's report.)

Several demographic assumptions were modified: (1) the starting population was updated to reflect the 1990 Census and other data; (2) the total fertility rate was decreased slightly for the first 25 projection years reflecting recently observed birth rates in 1991 that were lower than expected; (3) mortality assumptions were revised to incorporate the latest data; and (4) the ultimate net level of annual legal immigration was increased by 100,000 based on a reassessment of the effects of recent legislation by the Immigration and Naturalization Service. The net effect of these modifications is an increase in the long-range actuarial balance.

Ultimate economic assumptions for interest rates and growth rates in average wages and price levels were not changed for this report.

However, starting values were adjusted based on recent data and projected values for the first 10 years were updated to reflect current expectations. The assumed rate of increase in the gross domestic product (GDP) implicit price deflator was held below the rate of increase assumed for the CPI-W throughout the first 10 years, resulting in slightly slower real growth in average wage levels than was assumed for this period in last year's report. (The reason for this change is described in detail later in this section (in II.H.3). Other economic assumptions and projected rates of employment were updated to incorporate the latest information and analyses. The net effect of these changes is a decrease in the long-range actuarial balance.

Projections of the number of disabled beneficiaries were increased significantly reflecting recent increases in incidence rates and decreases in termination rates. These modifications result in a substantial reduction in the long-range actuarial balance for the DI program.

Several significant improvements and updates were made in the methods used to project future average benefit levels. The method used for projecting the future level of average benefits for disabled worker beneficiaries was improved to more accurately reflect the impact of the workers' compensation offset provision. This change resulted in a significant decrease in the level of projected benefits and thus significantly increased the OASDI actuarial balance. In addition, the method for projecting changes in benefit levels for female retired workers, after their initial benefit eligibility, was improved. The net effect of this change, along with various updates based on recent data, was a small increase in the estimated actuarial balance.

The cost of the OASDI program has been discussed in this section in relation to taxable payroll, which is a program-related concept that is very useful in analyzing the financial status of the OASDI program. The cost can also be discussed in relation to broader economic concepts, such as the gross domestic product (GDP). OASDI outlays generally rise from a little less than 5 percent of GDP currently to about 6.7 percent of GDP by the end of the 75-year projection period under alternative II. Discussion of both the cost and the taxable payroll of the OASDI program in relation to GDP is presented in section III.C.