E. ACTUARIAL STATUS OF THE TRUST FUNDS

Historically, the actuarial status of the OASDI program has been measured by the actuarial balance, as described earlier in this section. Recent annual reports have shown both medium-range and long-range average actuarial balances, which have been computed, respectively, for the 25-year and 75-year valuation periods beginning with the calendar year of issuance of the report. Thus, the medium-range and long-range actuarial balances shown in this report, calculated on a level-financing basis, pertain to the periods 1988-2012 and 1988-2062, respectively. Also presented is the level-financing actuarial balance for the first 50 years of the 75-year projection period.

As described earlier in this section, a single measure of the actuarial balance over a long period may not reveal problems which could occur during that period. Therefore, in addition to the medium-range and long-range actuarial balances, other indicators of the financial conditions of the program are shown in this report. One is the series of projected annual balances (that is, the year-by-year differences between the projected income rates and cost rates). Another is the series of projected contingency 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. Still another indicator is the projected ultimate level of annual balances. 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 projected covered workers and beneficiaries were born prior to the start of the projection period. However, lower fertility rates have negative 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 in the short term, as well as 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 trend and general range of expected future program experience. Appendix B contains a more detailed discussion of the effects on the estimates of varying certain economic and demographic assumptions.

Table 26 presents a comparison of the estimated income 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. Thus, the difference between the annual income rates and cost rates reflect the long-range effects of the trust-fund operations on a unified budget basis. Detailed long-range projections of trust-fund operations, in nominal dollar amounts, are shown in Appendix G.

The projections for OASDI show income rates that increase slowly and steadily due to the flat tax rate after 1989 and to the slowly 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 about 25 years, to increase rather rapidly for the next 25 years, and to remain relatively high thereafter. The relatively high cost plateau during the third 25-year subperiod is at a level of about 15.5 percent of taxable payroll under the II-A assumptions and about 16.5 percent of taxable payroll under the II-B assumptions. The income rate during the third 25-year subperiod covers about 85 percent of the cost under alternative II-A and about 80 percent of the cost under alternative II-B.

Attention is called to the projected pattern of the OASDI annual balances (that is, the difference between the income rates and the cost rates). Under alternative II-A assumptions the annual balances are positive for about 30 years and change to negative balances thereafter. Ultimately this annual deficit reaches 2.70 percent of taxable payroll by 2065. The pattern is similar under the alternative II-B assumptions, but early year positive balances are smaller and later deficits are larger. The ultimate deficit is 3.68 percent of taxable payroll by 2065 under alternative II-B.

TABLE 26.—COMPARISON OF ESTIMATED INCOME RATES AND COST RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1988-2065
[As a percentage of taxable payroll]

Calendar year	OASI			DI			Total		
	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance
Alternative I:									
1988	11.22	9.58	1.64	1.07	1.06	0.01	12.29	10.64	1.65
1989	11.23	9.46	1.77	1.07	1.04	.03	12.30	10.50	1.80
1990	11.35	9.39	1.96	1.21	1.01	.20	12.56	10.41	2.16
1991	11.39	9.27	2.12	1.21	.99	.22	12.60	10.26	2.34
1992	11.39	9.15	2.24	1.21	.98	.23	12.60	10.12	2.48
1993	11.39	9.01	2.39	1.21	.97	.24	12.60	9.97	2.63
1994	11.39	8.87	2.52	1.21	.96	.25	12.60	9.83	2.77
1995	11.39	8.75	2.64	1.21	.97	.24	12.60	9.72	2.88
1996	11.39	8.63	2.75	1.21	.97	.24	12.60	9.61	2.99
1997	11.39	8.53	2.86	1.21	.98	.23	12.60	9.51	3.09
2000	11.20	8.17	3.04	1.43	1.01	.43	12.64	9.17	3.47
2005	11.25	7.76	3.48	1.44	1.09	.35	12.69	8.86	3.83
2010	11.29	7.90	3.39	1.44	1.22	.22	12.73	9.12	3.61
2015	11.34	8.75	2.59	1.45	1.29	.15	12.79	10.04	2.74
2020	11.41	9.93	1.48	1.45	1.33	.12	12.86	11.26	1.60
2025	11.46	10.82	.64	1.45	1.38	.07	12.91	12.20	.71
2030	11.49	11.27	.22	1.45	1.35	.10	12.94	12.62	.32
2035	11.50	11.23	.27	1.45	1.31	.14	12.95	12.54	.41
2040	11.49	10.87	.62	1.45	1.30	.15	12.94	12.17	.77
2045	11.48	10.55	.93	1.45	1.32	.13	12.93	11.88	1.05
2050	11.48	10.42	1.06	1.45	1.33	.12	12.93	11.75	1.18
2055	11.48	10.37	1.11	1.45	1.32	.13	12.93	11.69	1.24
2060	11.48	10.29	1.19	1.45	1.31	.14	12.93	11.60	1.33
2065	11.48	10.20	1.28	1.45	1.31	.14	12.93	11.51	1.42
Alternative II-A:									
1988	11.22	9.61	1.61	1.07	1.08	-.01	12.29	10.69	1.60
1989	11.23	9.55	1.68	1.07	1.07	.00	12.30	10.62	1.69
1990	11.37	9.57	1.80	1.21	1.05	.16	12.58	10.62	1.96
1991	11.39	9.49	1.90	1.21	1.04	.17	12.60	10.54	2.07
1992	11.40	9.40	2.00	1.21	1.03	.18	12.61	10.43	2.18
1993	11.40	9.31	2.09	1.21	1.03	.18	12.61	10.35	2.26
1994	11.40	9.23	2.17	1.21	1.04	.17	12.61	10.27	2.34
1995	11.40	9.15	2.25	1.21	1.05	.16	12.61	10.19	2.41
1996	11.40	9.06	2.33	1.21	1.06	.15	12.61	10.12	2.48
1997	11.40	8.99	2.41	1.21	1.08	.14	12.61	10.06	2.54
2000	11.22	8.73	2.49	1.44	1.12	.31	12.66	9.85	2.80
2005	11.28	8.44	2.84	1.44	1.26	.18	12.72	9.71	3.02
2010	11.33	8.68	2.64	1.45	1.44	.01	12.78	10.13	2.65
2015	11.39	9.72	1.67	1.45	1.55	-.09	12.84	11.26	1.58
2020	11.47	11.18	.29	1.45	1.60	-.15	12.93	12.79	.14
2025	11.54	12.45	-.91	1.46	1.69	-.24	13.00	14.14	-1.14
2030	11.60	13.32	-1.72	1.46	1.68	-.22	13.05	15.00	-1.94

TABLE 26.—COMPARISON OF ESTIMATED INCOME RATES AND COST RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1988-2065 (Cont.)

[As a percentage of taxable payroll]

Calendar year	OASI			DI			Total		
	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance
Alternative II-A: (Cont.)									
2035	11.62	13.65	-2.03	1.46	1.65	-0.19	13.08	15.30	-2.22
2040	11.63	13.60	-1.97	1.46	1.65	-.19	13.08	15.25	-2.16
2045	11.63	13.54	-1.91	1.46	1.71	-.25	13.09	15.26	-2.17
2050	11.64	13.70	-2.06	1.46	1.74	-.28	13.10	15.44	-2.34
2055	11.66	13.93	-2.27	1.46	1.73	-.27	13.12	15.66	-2.55
2060	11.66	14.07	-2.41	1.46	1.72	-.25	13.12	15.79	-2.66
2065	11.67	14.11	-2.44	1.46	1.72	-.26	13.13	15.83	-2.70
Alternative II-B:									
1988	11.22	9.65	1.57	1.07	1.08	-.01	12.29	10.73	1.56
1989	11.23	9.65	1.59	1.07	1.08	-.01	12.30	10.72	1.58
1990	11.39	9.74	1.65	1.21	1.07	.14	12.60	10.81	1.79
1991	11.40	9.73	1.67	1.21	1.07	.15	12.61	10.80	1.81
1992	11.40	9.68	1.72	1.21	1.06	.15	12.62	10.75	1.87
1993	11.41	9.82	1.79	1.21	1.06	.15	12.62	10.68	1.94
1994	11.40	9.54	1.86	1.21	1.07	.15	12.62	10.61	2.01
1995	11.40	9.47	1.93	1.21	1.07	.14	12.62	10.55	2.07
1996	11.40	9.40	2.01	1.21	1.09	.13	12.62	10.48	2.13
1997	11.40	9.33	2.07	1.21	1.10	.11	12.62	10.43	2.19
2000	11.24	9.14	2.09	1.44	1.16	.28	12.67	10.30	2.37
2005	11.30	8.91	2.39	1.44	1.31	.14	12.75	10.22	2.53
2010	11.36	9.18	2.17	1.45	1.49	-.04	12.81	10.67	2.13
2015	11.42	10.26	1.16	1.45	1.60	-.15	12.88	11.86	1.02
2020	11.51	11.81	-.30	1.46	1.66	-.21	12.97	13.47	-.51
2025	11.59	13.18	-1.59	1.46	1.76	-.30	13.04	14.93	-1.89
2030	11.64	14.14	-2.50	1.46	1.74	-.28	13.10	15.88	-2.78
2035	11.67	14.54	-2.87	1.46	1.71	-.25	13.13	16.25	-3.12
2040	11.67	14.52	-2.84	1.46	1.71	-.25	13.13	16.23	-3.10
2045	11.68	14.47	-2.79	1.46	1.78	-.31	13.14	16.25	-3.11
2050	11.69	14.63	-2.94	1.46	1.80	-.34	13.15	16.43	-3.28
2055	11.70	14.86	-3.16	1.46	1.80	-.34	13.16	16.66	-3.50
2060	11.71	15.02	-3.31	1.46	1.78	-.32	13.17	16.80	-3.62
2065	11.72	15.07	-3.36	1.46	1.78	-.32	13.18	16.85	-3.68
Alternative III:									
1988	11.22	9.80	1.43	1.07	1.13	-.06	12.29	10.92	1.37
1989	11.24	10.02	1.22	1.07	1.16	-.09	12.31	11.18	1.13
1990	11.41	10.19	1.23	1.22	1.17	.05	12.63	11.35	1.27
1991	11.41	10.33	1.08	1.21	1.19	.02	12.62	11.52	1.10
1992	11.42	10.69	.73	1.21	1.24	-.03	12.64	11.94	.70
1993	11.43	10.60	.83	1.21	1.25	-.04	12.64	11.85	.79
1994	11.42	10.52	.90	1.21	1.27	-.05	12.64	11.79	.85
1995	11.42	10.43	.99	1.21	1.28	-.07	12.64	11.72	.92
1996	11.42	10.37	1.05	1.22	1.31	-.09	12.64	11.68	.96
1997	11.42	10.32	1.10	1.22	1.34	-.12	12.64	11.66	.98
2000	11.27	10.18	1.09	1.44	1.40	.04	12.71	11.58	1.13
2005	11.35	10.00	1.35	1.45	1.59	-.14	12.80	11.59	1.21
2010	11.41	10.35	1.06	1.46	1.84	-.38	12.87	12.19	.68
2015	11.49	11.66	-.17	1.46	2.00	-.54	12.95	13.66	-.71
2020	11.60	13.63	-2.03	1.47	2.10	-.63	13.07	15.73	-2.67
2025	11.70	15.59	-3.88	1.47	2.25	-.78	13.17	17.83	-4.66
2030	11.80	17.30	-5.50	1.47	2.26	-.79	13.27	19.56	-6.29
2035	11.86	18.46	-6.60	1.47	2.25	-.78	13.33	20.71	-7.38
2040	11.90	19.15	-7.25	1.47	2.30	-.83	13.37	21.46	-8.08
2045	11.94	19.80	-7.86	1.48	2.43	-.96	13.41	22.23	-8.82
2050	11.99	20.72	-8.74	1.48	2.51	-1.03	13.46	23.23	-9.76
2055	12.04	21.74	-9.70	1.48	2.51	-1.03	13.52	24.25	-10.73
2060	12.08	22.57	-10.49	1.48	2.48	-1.00	13.56	25.05	-11.49
2065	12.11	23.18	-11.07	1.48	2.48	-1.00	13.59	25.66	-12.07

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

Table 27 summarizes the projected annual figures presented in the previous table. Because any form of summarization involves choices between what to include and exclude in the summarized values, it is important to recognize that these summarized values should not be used as if they uniquely determined the status of the program or the financial effect of proposed modifications to it. These values are principally indicators that point towards possible significant situations projected for

the future. As such, they are useful tools in an assessment of the long-range financial conditions of the program. Based on the "average-cost" calculations the OASDI program would be estimated to be in "close actuarial balance" (income rate is between 95 and 105 percent of the cost rate over the 75-year valuation period) under the alternative II-A assumptions, but not to be in "close actuarial balance" under the alternative II-B assumptions. The estimated deficit of 0.18 percent of taxable payroll under the alternative II-A assumptions is less than 5 percent of the projected program's cost rate, while the estimated deficit of 0.87 percent of taxable payroll under the alternative II-B assumptions exceeds 5 percent of the projected cost rate. The average deficit of 0.18 percent for the 75-year period under alternative II-A is composed of a positive balance of 2.54 percent over the first 25-year subperiod and deficits of 0.71 percent and 2.38 percent over the second and third 25-year subperiods, respectively. Under alternative II-B, the average deficit of 0.87 percent over the 75-year period consists of a positive balance of 2.15 percent over the first 25-year subperiod and deficits of 1.45 percent and 3.32 percent over the 2nd and 3rd 25-year subperiods, respectively.

As discussed in the introduction to this section, the Board believes that the approximation embodied in the "average-cost" calculations is no longer useful in the summarization of OASDI financial projections. It is essential that, as larger funds are accumulated or projected to accumulate, the amounts of these funds and the full amount of interest that they will earn be explicitly included in the summarizing values. Table 27, therefore, also presents summarizing values on the basis of the "level-financing" calculations, which more accurately take into account the funds and the interest they earn. The table first shows the level-financing rates for each of the 25-year subperiods and for the entire 75-year period, excluding the funds on hand at the beginning of the period. The pattern by subperiod is similar to the pattern shown by the average-cost rates.

Table 27 next shows the level-financing rates including the funds on hand for the 75-year period, as well as for the first 25 years and the first 50 years. These more accurate summarizing values show that the OASDI program is in long-range "close actuarial balance" under either the alternative II-A assumptions or the alternative II-B assumptions. Under the more optimistic of the two intermediate assumptions the program would have a positive actuarial balance of 0.08 percent of taxable payroll, while under the more pessimistic there would be a deficit of 0.58 percent of taxable payroll. Both the positive balance under II-A and the deficit under II-B are less than 5 percent of the cost rate over the 75-year valuation period.

The "level-financing" values in table 27 also show that the program would operate with positive balances over shorter valuation periods. For the first 25-year period the summarizing values indicate that there would be positive balances of 3.24 percent of taxable payroll under alternative I, 2.63 percent under II-A, 2.24 percent under II-B, and 1.11 percent under III. Thus, the program is more than adequately financed over the next 25-year period under all four projections. Over a 50-year evaluation period, 1988-2037, the program would be estimated to have positive balances of 2.23 percent under alternative I, 1.08 percent under II-A, and

Also of interest are the long-range financial conditions of the separate OASI and DI programs. As may be concluded from tables 26 and 27, the OASI program is in much better financial condition than the DI program. The OASI program could operate for many decades into the future under all but the most pessimistic assumptions in alternative III, but the DI program would be able to do so only under the most optimistic assumptions in alternative I. The OASI program is projected to have a long-range positive balance of 0.16 percent and a deficit of 0.45 percent of taxable payroll under the II-A and II-B assumptions, respectively. These two actuarial balances are less than 5 percent of the cost rates and, therefore, the OASI program is in "close actuarial balance" under either of the two intermediate assumptions. The DI program is projected to have long-range actuarial deficits of 0.08 percent and 0.13 percent of taxable payroll under alternatives II-A and II-B, respectively. These two deficits are higher than 5 percent of the cost rates and, therefore, the DI program is not in "close actuarial balance" under either of the two intermediate assumptions.

Tables 26 and 27 also illustrate the spread of possible long-range costs and actuarial balances. For OASI, the cost rate projected for 2065 ranges from a low of 10.20 percent of taxable payroll under alternative I to a high of 23.18 percent of taxable payroll under alternative III. The actuarial balances for that year are projected to range from a positive balance of 1.28 percent under alternative I to a deficit of 11.07 percent under alternative III. The cost rate over the 75-year period is projected to range from a low of 9.73 percent under alternative I to a high of 14.55 percent under alternative III. The long-range actuarial balances over the entire 75-year period ranges from a positive balance of 1.69 percent under alternative I to a deficit of 2.89 percent of taxable payroll under alternative III.

The spread in the DI cost for 2065 is from a low of 1.31 percent of taxable payroll under alternative I to a high of 2.48 percent of taxable payroll under alternative III. The DI cost rate over the 75-year period ranges from a low of 1.23 percent of taxable payroll under alternative I to a high of 1.94 percent of taxable payroll under alternative III. The long-range actuarial balance ranges from a positive balance of 0.17 percent of taxable payroll under alternative I to a deficit of 0.53 percent of taxable payroll under alternative III.
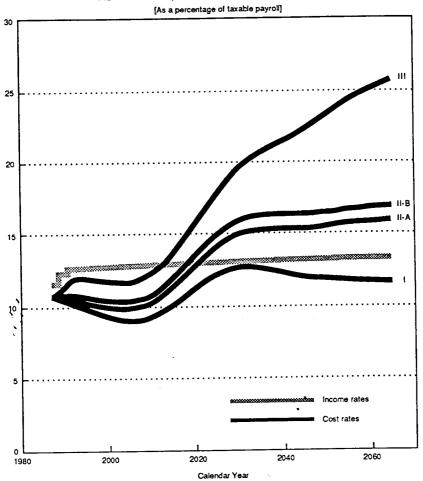
The spread between the lowest and highest projected annual cost rates and balances grows wider as the projections move further into the future. For OASDI the projected spread of cost rates in 2000 is 2.41 percent of taxable payroll (from 9.17 percent to 11.58 percent for alternatives I and III, respectively). By 2025 the spread is projected to increase to 5.63 percent of taxable payroll (from 12.20 percent to 17.83 percent) and by 2050 it is 11.48 percent of taxable payroll (from 11.75 percent to 23.23 percent). Because of the even greater uncertainty in projecting costs and revenues in the more distant future, the Board recommends caution in using the specific values projected.

Figure 2 shows in graphical form the patterns of the OASDI annual income and cost rates. In figure 2, the income rates for alternative II-B are shown in order to simplify the graphical presentation and because, as shown in table 26, the variation in the income rates by alternative is very small. The OASDI long-range income rates for alternatives I and III, over the next 75 years, on a level-financing basis, differ by only 0.24 percent of taxable payroll. By 2065, the income rates for each year, under alternatives I and III, differ by only 0.66 percent of taxable payroll. The income rates in figure 2 and table 26 show a distinct increase in 1990, when the payroll-tax rate is scheduled to rise under present law. Thereafter, only small fluctuations are projected, as the rate of income from taxation of benefits varies only slightly, by alternative, with changes in the cost rate.

The patterns of the annual balances are indicated in figure 2. 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. (Multiplied by the taxable payroll, these reflect the unified budget effect of the program. See Appendix G.) 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.

The future OASDI cost rate 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 2.—ESTIMATED OASDI INCOME RATES AND COST RATES BY ALTERNATIVE, CALENDAR YEARS 1987-2065

[As a percentage of taxable payroll]

The components of the annual income rates are shown in table 28, for each alternative set of assumptions. The income rates reflect the effects of the tax-rate increase scheduled for 1990 and the gradual increase in the rate of income from the taxation of benefits, as a greater percentage of benefits becomes taxable due to the flat (non-indexed) threshold amounts. Summaries of the estimated annual rates shown in table 28 are presented in table 29.

TABLE 28.—ESTIMATED INCOME RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1988-2065

[As a percentage of taxable payroll]

Calendar year	OASI			DI			Total		
	Payroll tax	Taxation of benefits	Total	Payroll tax	Taxation of benefits	Total	Payroll tax	Taxation of benefits	Total
Alternative I:									
1988	11.06	0.16	11.22	1.06	0.01	1.07	12.12	0.17	12.29
1989	11.06	.17	11.23	1.06	.01	1.07	12.12	.18	12.30
1990	11.20	.15	11.35	1.20	.01	1.21	12.40	.16	12.56
1991	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
1992	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
1993	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
1994	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
1995	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
1996	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
1997	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
2000	10.98	.22	11.20	1.42	.01	1.43	12.40	.24	12.64
2005	10.98	.27	11.25	1.42	.02	1.44	12.40	.29	12.69
2010	10.98	.31	11.29	1.42	.02	1.44	12.40	.33	12.73
2015	10.98	.36	11.34	1.42	.03	1.45	12.40	.39	12.79
2020	10.98	.43	11.41	1.42	.03	1.45	12.40	.46	12.86
2025	10.98	.48	11.46	1.42	.03	1.45	12.40	.51	12.91
2030	10.98	.51	11.49	1.42	.03	1.45	12.40	.54	12.94
2035	10.98	.52	11.50	1.42	.03	1.45	12.40	.55	12.95
2040	10.98	.51	11.49	1.42	.03	1.45	12.40	.54	12.94
2045	10.98	.50	11.48	1.42	.03	1.45	12.40	.53	12.93
2050	10.98	.50	11.48	1.42	.03	1.45	12.40	.53	12.93
2055	10.98	.50	11.48	1.42	.03	1.45	12.40	.53	12.93
2060	10.98	.50	11.48	1.42	.03	1.45	12.40	.53	12.93
2065	10.98	.50	11.48	1.42	.03	1.45	12.40	.53	12.93
Alternative II-A:									
1988	11.06	.16	11.22	1.06	.01	1.07	12.12	.17	12.29
1989	11.06	.17	11.23	1.06	.01	1.07	12.12	.18	12.30
1990	11.20	.17	11.37	1.20	.01	1.21	12.40	.18	12.58
1991	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
1992	11.20	.20	11.40	1.20	.01	1.21	12.40	.21	12.61
1993	11.20	.20	11.40	1.20	.01	1.21	12.40	.21	12.61
1994	11.20	.20	11.40	1.20	.01	1.21	12.40	.21	12.61
1995	11.20	.20	11.40	1.20	.01	1.21	12.40	.21	12.61
1996	11.20	.20	11.40	1.20	.01	1.21	12.40	.21	12.61
1997	11.20	.20	11.40	1.20	.01	1.21	12.40	.21	12.61
2000	10.98	.24	11.22	1.42	.02	1.44	12.40	.26	12.66
2005	10.98	.30	11.28	1.42	.02	1.44	12.40	.32	12.72
2010	10.98	.35	11.33	1.42	.03	1.45	12.40	.38	12.78
2015	10.98	.41	11.39	1.42	.03	1.45	12.40	.44	12.84
2020	10.98	.49	11.47	1.42	.03	1.45	12.40	.53	12.93
2025	10.98	.56	11.54	1.42	.04	1.46	12.40	.60	13.00
2030	10.98	.62	11.60	1.42	.04	1.46	12.40	.65	13.05
2035	10.98	.64	11.62	1.42	.04	1.46	12.40	.68	13.08
2040	10.98	.65	11.63	1.42	.04	1.46	12.40	.68	13.08
2045	10.98	.65	11.63	1.42	.04	1.46	12.40	.69	13.09
2050	10.98	.66	11.64	1.42	.04	1.46	12.40	.70	13.10
2055	10.98	.68	11.66	1.42	.04	1.46	12.40	.72	13.12
2060	10.98	.68	11.66	1.42	.04	1.46	12.40	.72	13.12
2065	10.98	.69	11.67	1.42	.04	1.46	12.40	.73	13.13
Alternative II-B:									
1988	11.06	.16	11.22	1.06	.01	1.07	12.12	.17	12.29
1989	11.06	.17	11.23	1.06	.01	1.07	12.12	.18	12.30
1990	11.20	.19	11.39	1.20	.01	1.21	12.40	.20	12.60
1991	11.20	.20	11.40	1.20	.01	1.21	12.40	.21	12.61
1992	11.20	.20	11.40	1.20	.01	1.21	12.40	.22	12.62
1993	11.20	.21	11.41	1.20	.01	1.21	12.40	.22	12.62
1994	11.20	.20	11.40	1.20	.01	1.21	12.40	.22	12.62
1995	11.20	.20	11.40	1.20	.01	1.21	12.40	.22	12.62
1996	11.20	.20	11.40	1.20	.01	1.21	12.40	.22	12.62
1997	11.20	.20	11.40	1.20	.01	1.21	12.40	.22	12.62

TABLE 28.—ESTIMATED INCOME RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1988-2065 (Cont.)

[As a percentage of taxable payroll]

Calendar year	OASI			DI			Total		
	Payroll tax	Taxation of benefits	Total	Payroll tax	Taxation of benefits	Total	Payroll tax	Taxation of benefits	Total
Alternative II-B: (Cont.)									
2000	10.98	0.26	11.24	1.42	0.02	1.44	12.40	0.27	12.67
2005	10.98	.32	11.30	1.42	.02	1.44	12.40	.35	12.75
2010	10.98	.38	11.36	1.42	.03	1.45	12.40	.41	12.81
2015	10.98	.44	11.42	1.42	.03	1.45	12.40	.48	12.88
2020	10.98	.53	11.51	1.42	.04	1.46	12.40	.57	12.97
2025	10.98	.61	11.59	1.42	.04	1.46	12.40	.64	13.04
2030	10.98	.66	11.64	1.42	.04	1.46	12.40	.70	13.10
2035	10.98	.69	11.67	1.42	.04	1.46	12.40	.73	13.13
2040	10.98	.69	11.67	1.42	.04	1.46	12.40	.73	13.13
2045	10.98	.70	11.68	1.42	.04	1.46	12.40	.74	13.14
2050	10.98	.71	11.69	1.42	.04	1.46	12.40	.75	13.15
2055	10.98	.72	11.70	1.42	.04	1.46	12.40	.76	13.16
2060	10.98	.73	11.71	1.42	.04	1.46	12.40	.77	13.17
2065	10.98	.74	11.72	1.42	.04	1.46	12.40	.78	13.18
Alternative III:									
1988	11.06	.16	11.22	1.06	.01	1.07	12.12	.17	12.29
1989	11.06	.18	11.24	1.06	.01	1.07	12.12	.19	12.31
1990	11.20	.21	11.41	1.20	.02	1.22	12.40	.23	12.63
1991	11.20	.21	11.41	1.20	.01	1.21	12.40	.22	12.62
1992	11.20	.22	11.42	1.20	.01	1.21	12.40	.24	12.64
1993	11.20	.23	11.43	1.20	.01	1.21	12.40	.24	12.64
1994	11.20	.22	11.42	1.20	.01	1.21	12.40	.24	12.64
1995	11.20	.22	11.42	1.20	.01	1.21	12.40	.24	12.64
1996	11.20	.22	11.42	1.20	.02	1.22	12.40	.24	12.64
1997	11.20	.22	11.42	1.20	.02	1.22	12.40	.24	12.64
2000	10.98	.29	11.27	1.42	.02	1.44	12.40	.31	12.71
2005	10.98	.37	11.35	1.42	.03	1.45	12.40	.40	12.80
2010	10.98	.43	11.41	1.42	.04	1.46	12.40	.47	12.87
2015	10.98	.51	11.49	1.42	.04	1.46	12.40	.55	12.95
2020	10.98	.62	11.60	1.42	.05	1.47	12.40	.67	13.07
2025	10.98	.72	11.70	1.42	.05	1.47	12.40	.77	13.17
2030	10.98	.82	11.80	1.42	.05	1.47	12.40	.87	13.27
2035	10.98	.88	11.86	1.42	.05	1.47	12.40	.93	13.33
2040	10.98	.92	11.90	1.42	.05	1.47	12.40	.97	13.37
2045	10.98	.96	11.94	1.42	.06	1.48	12.40	1.01	13.41
2050	10.98	1.01	11.99	1.42	.06	1.48	12.40	1.06	13.46
2055	10.98	1.06	12.04	1.42	.06	1.48	12.40	1.12	13.52
2060	10.98	1.10	12.08	1.42	.06	1.48	12.40	1.16	13.56
2065	10.98	1.13	12.11	1.42	.06	1.48	12.40	1.19	13.59

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

TABLE 29.—SUMMARIZED INCOME RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1988-2065

[As a percentage of taxable payroll]

Calendar year	OASI			DI			Total		
	Payroll tax	Taxation of bene-fits	Total	Payroll tax	Taxation of bene-fits	Total	Payroll tax	Taxation of bene-fits	Total
"Average-cost" basis:									
Alternative I:									
25-year averages:									
1988-2012	11.07	0.23	11.31	1.30	0.02	1.32	12.38	0.25	12.62
2013-2037	10.98	.46	11.44	1.42	.03	1.45	12.40	.49	12.89
2038-2062	10.98	.50	11.48	1.42	.03	1.45	12.40	.53	12.93
75-year average:									
1988-2062	11.01	.40	11.41	1.38	.02	1.41	12.39	.42	12.82
Alternative II-A:									
25-year averages:									
1988-2012	11.07	.25	11.33	1.30	.02	1.32	12.38	.27	12.65
2013-2037	10.98	.54	11.52	1.42	.04	1.46	12.40	.58	12.98
2038-2062	10.98	.66	11.64	1.42	.04	1.46	12.40	.70	13.10
75-year average:									
1988-2062	11.01	.49	11.50	1.38	.03	1.41	12.39	.52	12.91
Alternative II-B:									
25-year averages:									
1988-2012	11.07	.27	11.34	1.30	.02	1.32	12.38	.29	12.67
2013-2037	10.98	.59	11.57	1.42	.04	1.46	12.40	.62	13.02
2038-2062	10.98	.71	11.69	1.42	.04	1.46	12.40	.75	13.15

TABLE 29.—SUMMARIZED INCOME RATES BY TRUST FUND AND ALTERNATIVE, CALENDAR
YEARS 1988-2065 (Cont.)
[As a percentage of taxable payroll]

	OASI			DI			Total		
Calendar year	Payroll tax	Taxation of bene-fits	Total	Payroll tax	Taxation of bene-fits	Total	Payroll tax	Taxation of bene-fits	Total
"Average-cost" basis: (Cont.)									
Alternative II-B: (Cont.)									
75-year average:									
1988-2062	11.01	0.52	11.53	1.38	0.03	1.41	12.39	0.55	12.95
Alternative III:									
25-year averages:									
1988-2012	11.07	.30	11.38	1.30	.02	1.33	12.38	.33	12.70
2013-2037	10.98	.71	11.69	1.42	.05	1.47	12.40	.76	13.16
2038-2062	10.98	1.01	11.99	1.42	.06	1.48	12.40	1.07	13.47
75-year average:									
1988-2062	11.01	.67	11.69	1.38	.04	1.42	12.39	.72	13.11
"Level-financing" basis:									
Alternative I:									
25 years:1988-2012.	11.04	.23	11.28	1.29	.02	1.31	12.34	.25	12.59
50 years:1988-2037.	11.00	.34	11.34	1.35	.02	1.37	12.35	.36	12.71
75 years:1988-2062.	10.98	.39	11.38	1.37	.02	1.40	12.36	.42	12.77
Alternative II-A:									
25 years:1988-2012.	11.04	.25	11.29	1.29	.02	1.31	12.34	.27	12.60
50 years:1988-2037.	11.00	.39	11.38	1.35	.03	1.38	12.35	.41	12.76
75 years:1988-2062.	10.98	.46	11.45	1.37	.03	1.40	12.35	.49	12.85
Alternative II-B:									
25 years:1988-2012.	11.04	.27	11.31	1.29	.02	1.31	12.33	.28	12.62
50 years:1988-2037.	11.00	.41	11.41	1.35	.03	1.38	12.34	.44	12.78
75 years:1988-2062.	10.98	.50	11.48	1.37	.03	1.40	12.35	.53	12.88
Alternative III:									
25 years:1988-2012.	11.04	.30	11.34	1.29	.02	1.31	12.33	.32	12.64
50 years:1988-2037.	11.00	.48	11.47	1.34	.03	1.38	12.34	.51	12.85
75 years:1988-2062.	10.98	.61	11.59	1.36	.04	1.40	12.34	.65	12.99

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

The primary reason that the estimated OASDI cost rate increases rapidly after 2005 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 30.

TABLE 30.—COMPARISON OF OASDI COVERED WORKERS AND BENEFICIARIES
BY ALTERNATIVE, CALENDAR YEARS 1945-2065

Calendar year	Covered workers[1] (in thousands)	Beneficiaries[2] (in thousands)			Covered workers per OASDI beneficiary	Beneficiaries per 100 covered workers
		OASI	DI	Total		
Past experience:						
1945.............................	46,930	1,106	—	1,106	42.4	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	20,157	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.............................	112,980	30,385	4,734	35,119	3.2	31
1985.............................	³121,300	32,776	3,874	36,650	³3.3	³30
1986.............................	³124,500	33,349	3,972	37,321	³3.3	³30
1987.............................	³127,917	33,917	4,034	37,952	³3.4	³30
Alternative I:						
1988.............................	129,969	34,378	4,090	38,469	3.4	30
1990.............................	133,467	35,550	4,133	39,683	3.4	30
1995.............................	141,234	37,564	4,377	41,941	3.4	30
2000.............................	147,240	38,659	4,820	43,479	3.4	30
2005.............................	152,656	39,853	5,429	45,282	3.4	30
2010.............................	156,688	42,678	6,131	48,809	3.2	31

TABLE 30.—COMPARISON OF OASDI COVERED WORKERS AND BENEFICIARIES BY ALTERNATIVE, CALENDAR YEARS 1945-2065 (Cont.)

Calendar year	Covered workers[1] (in thousands)	Beneficiaries[2] (in thousands)			Covered workers per OASDI beneficiary	Beneficiaries per 100 covered workers
		OASI	DI	Total		
Alternative I: (Cont.)						
2015	159,318	48,027	6,527	54,555	2.9	34
2020	160,946	54,713	6,746	61,459	2.6	38
2025	162,762	60,805	7,117	67,923	2.4	42
2030	165,667	65,273	7,122	72,395	2.3	44
2035	169,418	67,521	7,079	74,600	2.3	44
2040	173,321	67,731	7,180	74,911	2.3	43
2045	177,237	67,817	7,495	75,312	2.4	42
2050	181,370	68,543	7,733	76,277	2.4	42
2055	185,940	69,762	7,907	77,669	2.4	42
2060	190,859	71,065	8,062	79,127	2.4	41
2065	195,847	72,372	8,290	80,662	2.4	41
Alternative II-A:						
1988	129,834	34,381	4,100	38,481	3.4	30
1990	133,016	35,581	4,203	39,784	3.3	30
1995	140,193	37,815	4,608	42,423	3.3	30
2000	145,508	39,253	5,289	44,542	3.3	31
2005	149,900	40,805	6,039	46,844	3.2	31
2010	152,882	43,952	6,891	50,843	3.0	33
2015	154,048	49,666	7,366	57,033	2.7	37
2020	153,719	56,782	7,607	64,390	2.4	42
2025	153,072	63,344	7,991	71,335	2.1	47
2030	152,931	68,355	7,937	76,291	2.0	50
2035	153,275	71,118	7,823	78,942	1.9	52
2040	153,473	71,737	7,858	79,595	1.9	52
2045	153,348	72,090	8,117	80,207	1.9	52
2050	153,047	72,960	8,244	81,204	1.9	53
2055	152,928	74,054	8,237	82,291	1.9	54
2060	153,010	74,850	8,178	83,027	1.8	54
2065	153,112	75,311	8,203	83,514	1.8	55
Alternative II-B:						
1988	129,690	34,381	4,100	38,481	3.4	30
1990	132,396	35,581	4,203	39,784	3.3	30
1995	139,177	37,815	4,608	42,422	3.3	30
2000	144,261	39,251	5,285	44,536	3.2	31
2005	148,453	40,801	6,032	46,832	3.2	32
2010	151,428	43,943	6,880	50,824	3.0	34
2015	152,614	49,654	7,351	57,005	2.7	37
2020	152,286	56,765	7,589	64,354	2.4	42
2025	151,648	63,320	7,970	71,290	2.1	47
2030	151,494	68,323	7,914	76,236	2.0	50
2035	151,830	71,078	7,799	78,877	1.9	52
2040	152,017	71,688	7,833	79,521	1.9	52
2045	151,895	72,033	8,091	80,124	1.9	53
2050	151,614	72,895	8,218	81,113	1.9	53
2055	151,478	73,982	8,211	82,193	1.8	54
2060	151,566	74,773	8,152	82,925	1.8	55
2065	151,668	75,232	8,177	83,409	1.8	55
Alternative III:						
1988	129,263	34,384	4,128	•38,512	3.4	30
1990	130,013	35,612	4,354	39,966	3.3	31
1995	136,479	38,054	5,117	43,170	3.2	32
2000	141,280	39,797	5,955	45,752	3.1	32
2005	144,466	41,695	6,889	48,584	3.0	34
2010	146,380	45,214	7,936	53,150	2.8	36
2015	146,113	51,437	8,507	59,943	2.4	41
2020	143,985	59,218	8,770	67,988	2.1	47
2025	141,049	66,567	9,170	75,737	1.9	54
2030	138,088	72,550	9,041	81,591	1.7	59
2035	135,355	76,335	8,838	85,173	1.6	63
2040	132,337	77,900	8,794	86,695	1.5	66
2045	128,786	79,045	8,993	88,038	1.5	68
2050	124,911	80,558	8,986	89,544	1.4	72
2055	121,099	81,973	8,750	90,723	1.3	75
2060	117,565	82,624	8,416	91,041	1.3	77
2065	114,200	82,500	8,196	90,696	1.3	79

[1] Workers who pay OASDI taxes at some time during the year.

[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 21,402 as of June 30, 1987, 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 30 shows that the number of covered workers per beneficiary, which was about 3.4 in 1987, 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 about 2.4. 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. Based on alternatives II-A and II-B, the ratio declines to 1.8 workers per beneficiary.

The impact of the demographic shifts under the four alternatives on the OASDI cost rates is better understood by considering the projected number of beneficiaries per 100 workers. As compared to the current level of 30 beneficiaries per 100 covered workers, this ratio rises by the end of the long-range valuation period to a significantly higher level, which ranges from 41 under alternative I to 79 under alternative III. The salience of these numbers can be seen by comparing figure 2 to figure 3, which is a graphical representation of the beneficiaries per 100 covered workers shown in table 30. For each alternative, the shape of the curve in figure 3 is strikingly similar to that of the corresponding cost-rate curve in figure 2, thereby emphasizing the extent to which the cost of the OASDI program is determined by the age patterns of the population. Because, conceptually, the cost rate consists of the product of the number of beneficiaries and their average benefit, divided by the product of the number of covered workers and their 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 the "Summary."

FIGURE 3.—RATIOS OF ESTIMATED OASDI BENEFICIARIES PER 100
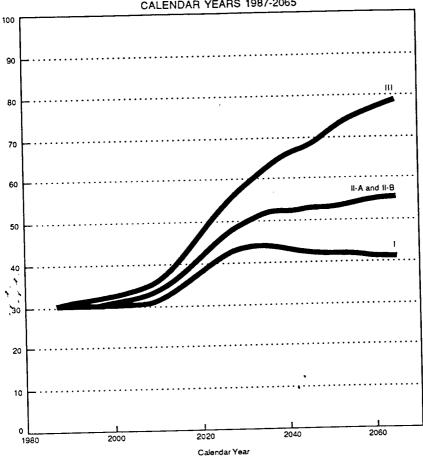COVERED WORKERS BY ALTERNATIVE,
CALENDAR YEARS 1987-2065

Table 31 shows, by alternative, the estimated contingency fund ratios for the separate and combined OASI and DI Trust Funds. The patterns of the combined fund ratios, over the 75-year period, are also shown in figure 4, for all four sets of assumptions. The OASI and DI ratios are estimated to be relatively low for the next several years, before generally increasing to very high levels thereafter. Based on alternatives II-A and II-B, the OASI ratio peaks about 2015, when it is 722 percent and 587 percent, respectively, and the DI ratio peaks about 2010 and 2005, when it is 267 percent and 221 percent, respectively. Thereafter, the OASI and DI ratios decline steadily. Under alternative II-A, the DI Trust Fund becomes exhausted in 2035; under alternative II-B, the OASI and DI funds become exhausted in 2050 and 2027, respectively. Based on alternative I, the ratios increase throughout the long-range projection period to extremely high levels, around 1,000-1,300 percent for the OASI and DI programs. In contrast, under alternative III, the OASI and DI Trust Funds are estimated to be exhausted within 42 years and 9 years, respectively. Thus, because of the high ultimate cost rates that are projected under all but the most optimistic assumptions, eventually income will need to be increased or program costs will need to be reduced in order to prevent the OASI and DI Trust Funds from becoming exhausted.

The OASI and DI funds combined are projected to be exhausted in 2026 under the pessimistic assumptions in alternative III and in 2048 under the intermediate assumptions of alternative II-B. Under either alternative I or II-A the combined OASDI funds are projected to remain positive throughout the projection period. This means that under the most pessimistic assumptions the OASDI funds and income would be able to cover expenditures for about 40 years into the future and that under the alternative II-B assumptions the OASDI funds and income would be able to cover expenditures for about 60 years into the future. The program would be able to cover expenditures for a longer period under alternative II-A and for the indefinite future under the most optimistic assumptions in alternative I. In the 1987 report, the combined trust funds were projected to be exhausted in 2025 under alternative III and in 2051 under alternative II-B.

TABLE 31.—ESTIMATED CONTINGENCY FUND RATIOS BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1988-2065

[In percent]

Calendar year	Alternative I			Alternative II-A			Alternative II-B			Alternative III		
	OASI	DI	Total	OASI	DI	Total	OASI	DI	Total	OASI	DI	Total
1988	41	39	41	41	38	41	41	38	41	41	37	41
1989	59	41	58	59	39	57	58	38	56	56	33	54
1990	79	47	76	77	41	73	75	39	71	68	27	64
1991	102	68	99	97	56	93	93	53	89	80	30	74
1992	128	92	124	120	74	115	112	67	107	90	31	84
1993	156	118	153	144	92	139	132	81	127	99	28	91
1994	188	145	183	170	109	164	153	96	147	109	25	100
1995	221	171	216	197	126	190	176	110	169	120	21	109
1996	256	196	250	225	140	216	199	122	191	132	15	119
1997	292	218	285	254	153	244	223	132	214	144	(¹)	128
2000	414	281	399	349	182	330	301	154	285	185	(¹)	160
2005	635	434	611	514	263	482	431	221	404	248	(¹)	210
2010	843	505	798	663	267	607	547	213	501	303	(¹)	243
2015	946	554	895	722	240	656	587	173	531	302	(¹)	229
2020	956	600	915	698	200	635	550	118	497	236	(¹)	159
2025	945	622	908	639	141	580	477	46	427	126	(¹)	48
2030	937	667	908	568	73	513	388	(¹)	341	(¹)	(¹)	(¹)
2035	956	739	934	501	14	448	295	(¹)	251	(¹)	(¹)	(¹)

TABLE 31.—ESTIMATED CONTINGENCY FUND RATIOS BY TRUST FUND AND ALTERNATIVE, CALENDAR YEARS 1988-2065 (Cont.)
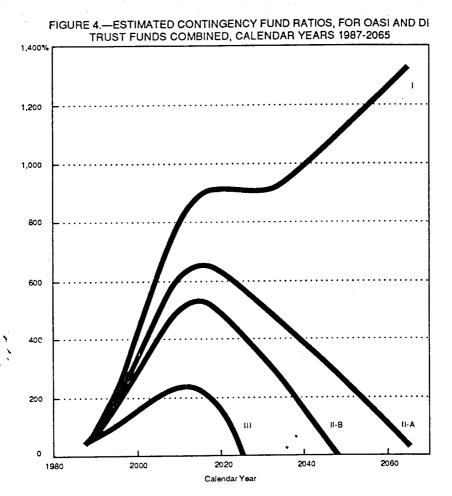
[In percent]

Calendar year	Alternative I			Alternative II-A			Alternative II-B			Alternative III		
	OASI	DI	Total	OASI	DI	Total	OASI	DI	Total	OASI	DI	Total
2040	1,013	807	991	443	(¹)	390	204	(¹)	162	(¹)	(¹)	(¹)
2045	1,086	848	1,060	386	(¹)	331	113	(¹)	71	(¹)	(¹)	(¹)
2050	1,154	893	1,125	322	(¹)	265	18	(¹)	(¹)	(¹)	(¹)	(¹)
2055	1,217	949	1,187	249	(¹)	190	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
2060	1,285	1,011	1,254	170	(¹)	111	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
2065	1,362	1,066	1,328	88	(¹)	29	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Trust fund is estimated to be exhausted in:	(²)	(²)	(²)	(²)	2035	(²)	2050	2027	2048	2029	1996	2026

¹The fund is estimated to be exhausted in the year shown in the last line of the table.

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

Note: See footnote 2 of table 13 for definition of contingency 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 contingency fund ratios for the combined trust funds is shown in figure 4 for each of the alternative sets of assumptions.

FIGURE 4.—ESTIMATED CONTINGENCY FUND RATIOS, FOR OASI AND DI
TRUST FUNDS COMBINED, CALENDAR YEARS 1987-2065

Reasons for differences between last year's report and this report in the long-range actuarial balance under the II-B assumptions are itemized in table 32. Also shown are the estimated effects associated with each reason for change.

TABLE 32.—CHANGE IN ACTUARIAL BALANCE ESTIMATED ON THE BASIS OF ALTERNATIVE II-B BY TRUST FUND AND REASON FOR CHANGE
[As a percentage of taxable payroll]

Item	OASI	DI	Total
Shown in last year's report[1]:			
Average income rate	11.46	1.44	12.89
Average-cost rate	11.89	1.63	13.51
Actuarial balance (average-cost basis)	-.43	-.19	-.62
Changes in actuarial balance due to changes in:			
Valuation period	-.04	-.01	-.05
Methods[2]	-.31	+.01	-.30
Demographic assumptions	+.16	+.01	+.17
Economic assumptions	-.12	-.01	-.13
Disability assumptions	+.00	+.02	+.02
All other changes	+.01	+.02	+.03
Total change in actuarial balance	-.30	+.04	-.26
Shown in this report[3]:			
Actuarial balance (average-cost basis)	-.72	-.15	-.87
Average income rate	11.53	1.41	12.95
Average-cost rate	12.26	1.56	13.82
Recognition of January 1, 1988 funds[4]	+.05	+.01	+.06
Modified actuarial balance (average-cost basis)	-.67	-.14	-.81
Change due to level-financing calculations[5]	+.23	+.01	+.24
Rates shown in this report on level-financing basis:			
Actuarial balance	-.45	-.13	-.58
Income rate[5]	11.53	1.40	12.94
Cost rate	11.99	1.53	13.52

[1]Income rates, cost rates, and taxable payroll are calculated on the basis of alternative II-B assumptions, as described in the 1987 report. Several of those assumptions have been modified for this year's report. A description of the modifications is presented in the text of this report.

[2]Methods used to project the annual income and expenditures have been modified to attain higher consistency between the short-range and long-range projections.

[3]Includes the trust fund balances as of the start of the valuation period.

[4]Average-cost calculations, as previously used, did not take into account the funds on hand at the start of the valuation period.

[5]Level-financing calculations more accurately take into account interest earnings on the accumulated funds and result in a lower long-range balance.

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

In changing from the valuation period of last year's report, which was 1987-2061, to the valuation period of this report, 1988-2062, the positive balance year of 1987 was replaced by the deficit year of 2062. This results in a decrease in the long-range actuarial balance, on an average-cost basis. (However, the positive balance for 1987 is, in effect, restored—using actual experience—later in table 32, when the January 1, 1988, funds are recognized.)

Several modifications in the methods used to prepare the projections and in the assumptions adopted as the basis for the projections were incorporated in this year's report. The most significant modifications in methods were made to improve the consistency between the short-range and the long-range projections. The two separate sets of methods, which necessarily differ because of their different uses, were yielding projected values that were significantly different at their common point of juncture. The modified methods, which now yield a smoother transition from the short-range projections to the long-range projections, result in a decrease in the long-range actuarial balance.

All demographic assumptions were modified: (1) the starting population, used in the projection of the Social Security Area population, was updated; (2) the ultimate total fertility rate was lowered from 2.0 to 1.9; (3) mortality assumptions were revised to incorporate the latest data and analyses; and (4) the net immigration assumption was increased from 400,000 to 600,000 persons per year in order to reflect current estimates of other-than-legal immigration. The net effect of these modifications is an increase in the long-range actuarial balance.

Short-range economic assumptions were updated to incorporate the latest information and analyses, and the ultimate assumed real-wage differential was lowered from 1.5 to 1.4 percent per year. These have the net effect of decreasing the long-range actuarial balance.

Death rates for disabled beneficiaries were modified. While previously it was assumed that the ultimate rates would be about 75 percent of the recent experience, now it is assumed that the ultimate rates will be 70 percent of the recent experience for men and 80 percent of recent experience for women. The net result is a small increase in the long-range actuarial balance.

Other assumptions were updated and modified, but the net effect on the long-range actuarial balance is small.

The long-range actuarial balances are presented in this report on the basis of two different calculations: (1) average-cost and (2) level-financing. These two different calculations for summarizing values over the entire 75-year projection period are based on the same annual projections of income and expenditures. Their difference consists of the way in which these projected annual values are summarized. The level-financing calculations fully and explicitly take into account interest earnings on the accumulated funds, while the average-cost calculations do so implicitly and, in general, only partially. Although the Board believes that for this report the level-financing calculations are preferable, it is presenting the results of both calculations so as to document the effect of the change.

Table 32 shows an intermediate step in moving from the average-cost basis to the level-financing basis. The average-cost calculations shown in earlier reports did not take into account the trust fund balances at the start of the valuation period. The starting fund balance can be incorporated into the calculations of the long-range actuarial balance on either basis. According to table 32, therefore, under alternative II-B the OASDI long-range actuarial balance is a deficit of 0.87 percent of taxable payroll based on average-cost calculations, a deficit of 0.81 percent of taxable payroll if the starting fund balance is taken into account in the average-cost calculations, and a deficit of 0.58 percent of taxable payroll based on the level-financing calculations with the starting trust fund balance taken into account.

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 national product (GNP). A discussion of both the cost and the taxable payroll of the OASDI program in relation to GNP is presented in Appendix F.

VI. CONCLUSION

The economy continued to grow in 1987, and the combined assets of the OASI and DI Trust Funds also grew. The growth of the combined trust funds in calendar year 1987 was larger than estimated in the 1987 Annual Report on the basis of both sets of intermediate assumptions, alternatives II-A and II-B. As a result, the ability of the OASDI program to withstand temporary economic downturns improved significantly during the year.

The long-range actuarial estimates in this report show that the OASDI program as a whole is in close actuarial balance, on a level-financing basis. Over the 75-year projection period, the OASDI program has an estimated level-financing deficit of 0.58 percent of taxable payroll, based on the intermediate alternative II-B assumptions. This deficit represents about 4.3 percent of the level-financing cost rate. In other words, the long-range income rate (including the funds on hand at the beginning of the valuation period) represents about 95.7 percent of the long-range cost rate.

However, while the program is in close actuarial balance, deficits appear after the first three decades, based on both sets of intermediate assumptions—alternatives II-A and II-B. The OASDI long-range estimates based on both alternatives show a pattern of recurring annual positive balances in the first three decades and recurring annual deficits thereafter. These annual balances do not reflect interest earnings, which, when taken into account, result in trust fund growth, in dollars, continuing for another 10 to 15 years after the first annual deficit occurs.

The estimates therefore show that the assets of the OASI and DI Trust Funds, on a combined basis, will be sufficient to enable the timely payment of OASDI benefits for many years into the future, on the basis of all four sets of economic and demographic assumptions. Based on alternative I, the funds continue to grow throughout the 75-year projection period. On the basis of alternative II-A, the combined funds build up and then decline, but do not become exhausted, during the next 75 years. The combined funds are estimated to build up, then decline, and then become exhausted in 2048, or 60 years from now, based on alternative II-B. Based on alternative III, the combined funds are estimated to become exhausted in 2026, after first building up and then declining. Thus, even under the most pessimistic assumptions shown in this report, OASDI benefits can be paid for another 3 1/2 decades without legislation to increase income or reduce expenditures.

The estimates for each trust fund, separately, indicate that the OASI program can operate satisfactorily for many years, as shown by all four sets of estimates. However, while the DI program would operate satisfactorily for many years on the basis of optimistic or intermediate assumptions like those designated as alternatives I, II-A, and II-B, it would become exhausted by late 1996, on the basis of the more pessimistic assumptions represented by alternative III.

For OASI and DI, separately, the level-financing long-range deficits, based on alternative II-B, are 0.45 percent and 0.13 percent of taxable payroll, respectively. The deficit for DI represents about 8.3 percent of the 75-year cost rate; thus, the DI program is not in close actuarial

balance. The DI program could be brought into close actuarial balance, however, by a small reallocation of the contribution rate from OASI to DI, in such a way that the OASI program would still remain in close actuarial balance. While such a reallocation is not being recommended, the financial condition of the DI program needs to be carefully monitored in both the short-range and long-range periods.

For several years, the single figure representing the long-range actuarial balance over the 75-year projection period, as well as the figure for each of the 25-year subperiods, has been calculated on an "average-cost" basis. For comparability with the 1987 report, the OASDI average actuarial balance over the 75-year projection period is a deficit of 0.87 percent of taxable payroll, based on the alternative II-B assumptions. During the first 25 years, the average balance is a positive balance of 2.15 percent of taxable payroll. However, the average balances in the second and third 25-year subperiods are deficits of 1.45 percent and 3.32 percent, respectively. On a level-financing basis, the corresponding balances for the first, second, and third 25-year subperiods are a positive balance of 2.07 percent and deficits of 1.44 percent and 3.39 percent, respectively. (These balances are based on alternative II-B and do not include the funds on hand at the beginning of the projection period.)

Thus, in the absence of other changes, the long-range actuarial balance will tend to decline slowly in future annual reports, as the valuation period moves forward and additional distant years of deficit are included in the valuation. The actuarial deficits in the later years of the 75-year projection period are caused primarily by the demographic trends, which will result in a lower ratio of workers to beneficiaries in the distant future.

Under the average-cost basis, the balance for each period is determined by calculating the arithmetic mean of the annual balances over the period. The average-cost calculation does not correctly reflect the full effects of the interest earnings of the accumulated trust funds. On the other hand, the level-financing calculations shown in this report properly reflect the full effect of interest earnings. Thus, the 75-year actuarial deficit of 0.58 percent of taxable payroll, on a level-financing basis, is a more accurate measure because it takes account of all the interest earnings of the trust funds, as well as the funds on hand at the beginning of the projection period.