D. ACTUARIAL ANALYSIS OF BENEFIT DISBURSEMENTS FROM THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE TRUST FUND WITH RESPECT TO DISABLED BENEFICIARIES

(Required by section 201(c) of the Social Security Act)

Effective January 1957, monthly benefits have been payable from the OASI Trust Fund to disabled children aged 18 and over of retired and deceased workers in those cases in which the disability began before age 18. The age before which disability is required to have begun was subsequently changed to age 22. Effective February 1968, reduced monthly benefits have been payable from this trust fund to disabled widows and widowers at ages 50 and above.

On December 31, 1983, about 550,000 persons were receiving monthly benefits from the OASI Trust Fund because of their disability or the disability of a child. This total includes 46,000 mothers and fathers (wives or husbands under age 65 of retired-worker beneficiaries and widows or widowers of deceased insured workers) who met all other qualifying requirements and were receiving unreduced benefits solely because they had a disabled-child beneficiary in their care. Also included, beginning in 1981, are mothers and fathers, as described above, who are eligible to receive benefits solely because they have a disabled child aged 16 or 17 in their care. Benefits paid from this trust fund to the persons described above totaled $1,691 million in calendar year 1983. Similar figures are presented in table 26 to show the experience in selected calendar years during 1960-83. Figures relating to past experience for years not shown are contained in prior annual reports.

TABLE 26.—BENEFITS PAYABLE FROM THE OASI TRUST FUND WITH RESPECT TO DISABLED BENEFICIARIES, SELECTED CALENDAR YEARS 1960-88
[Beneficiaries in thousands; benefit payments in millions]

Calendar year	Disabled beneficiaries, end of year			Amount of benefit payments[1]		
	Total	Children[2]	Widows and widowers	Total	Children[2]	Widows and widowers[3]
Past experience:						
1960	117	117	—	$59	$59	—
1965	214	214	—	134	134	—
1970	316	281	36	301	260	$41
1975	435	376	59	664	560	104
1976	457	395	62	748	637	111
1977	480	414	65	868	748	120
1978	494	430	64	950	823	127
1979	507	445	62	1,071	946	125
1980	519	460	59	1,223	1,097	126
1981	527	473	54	1,421	1,296	125
1982	533	484	49	1,566	1,451	115
1983	550	504	46	1,691	1,581	110
Estimated future experience:						
Alternative II-A:						
1984	562	516	46	1,900	1,747	153
1985	574	529	45	2,062	1,902	160
1986	585	540	45	2,228	2,061	167
1987	597	552	45	2,400	2,225	175
1988	610	565	45	2,580	2,396	184
Alternative II-B:						
1984	562	516	46	1,902	1,749	153
1985	574	529	45	2,076	1,915	161
1986	585	540	45	2,262	2,092	170
1987	597	552	45	2,458	2,279	179
1988	610	565	45	2,663	2,473	190

[1]Beginning in 1966, includes payments for vocational rehabilitation services.

[2]Reflects the effect of including certain mothers and fathers.

[3]In 1983 and prior years, reflects the offsetting effect of lower benefits payable to disabled widows and widowers who continue to receive benefits after attaining age 60 (62, for disabled widowers, prior to 1973) as compared to the higher nondisabled widow's (and widower's) benefits that would otherwise be payable.

Table 26 also shows the estimated future experience in calendar years 1984-88, based on the alternative II-A and II-B assumptions described in an earlier section. Total benefit payments from the OASI Trust Fund with respect to disabled beneficiaries are estimated to increase from $1,900 million in calendar year 1984 to $2,580 million in calendar year 1988, based on the alternative II-A assumptions, and to $2,663 million in calendar year 1988, based on the alternative II-B assumptions.

In calendar year 1983, benefit payments (including expenditures for vocational rehabilitation services) with respect to disabled persons from the OASI Trust Fund and from the DI Trust Fund (including payments from the latter fund to all children and spouses of disabled-worker beneficiaries) totaled $19,221 million, of which $1,691 million, or 8.8 percent, represented payments from the OASI Trust Fund. Similar figures for selected calendar years during 1960-83 and estimates for calendar years 1984-88, based on alternatives II-A and II-B, are presented in table 27. Figures relating to past experience for years not shown in table 27 are contained in prior annual reports.

TABLE 27.—BENEFIT PAYMENTS UNDER THE OASDI PROGRAM WITH RESPECT TO DISABLED BENEFICIARIES, BY TRUST FUND, SELECTED CALENDAR YEARS 1960-88
[Amounts in millions]

Calendar year	Benefit payments[1] from — Total[1]	DI Trust Fund[2]	OASI Trust Fund Amount[3]	OASI Trust Fund As a percentage of total benefit payments with respect to disabled beneficiaries
Past experience:				
1960	$627	$568	$59	9.4
1965	1,707	1,573	134	7.9
1970	3,386	3,085	301	8.9
1975	9,169	8,505	664	7.2
1976	10,803	10,055	748	6.9
1977	12,415	11,547	868	7.0
1978	13,549	12,599	950	7.0
1979	14,857	13,786	1,071	7.2
1980	16,738	15,515	1,223	7.3
1981	18,621	17,200	1,421	7.6
1982	18,904	17,338	1,566	8.3
1983	19,221	17,530	1,691	8.8
Estimated future experience:				
Alternative II-A:				
1984	19,642	17,742	1,900	9.7
1985	20,156	18,094	2,062	10.2
1986	21,152	18,924	2,228	10.5
1987	22,262	19,862	2,400	10.8
1988	23,517	20,937	2,580	11.0
Alternative II-B:				
1984	19,644	17,742	1,902	9.7
1985	20,218	18,142	2,076	10.3
1986	21,364	19,102	2,262	10.6
1987	22,664	20,206	2,458	10.8
1988	24,118	21,455	2,663	11.0

[1]Beginning in 1966, includes payments for vocational rehabilitation services.

[2]Benefit payments to disabled workers and their children and spouses.

[3]Benefit payments to disabled children aged 18 and over, to certain mothers and fathers (see text), and to disabled widows and widowers (see footnote 3, table 26).

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 actuarial balances, which have been computed, respectively, over the 25-year and 75-year periods beginning with the calendar year of issuance of the report. Accordingly, the medium-range and long-range actuarial balances shown in this report pertain to the periods 1984-2008 and 1984-2058, respectively. Also presented are actuarial balances for the second and third 25-year subperiods 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, two other indicators of the financial condition of the trust funds are shown in this report. One is the series of annual balances (that is, the year-by-year differences between the projected total income rates and cost rates), and the other is the series of projected trust fund ratios (assets at the beginning of the year expressed as a percentage of outgo during the year). The significance of these indicators was discussed earlier.

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 projected fertility rates have little effect on the medium-range estimates, because almost all of the projected covered workers and beneficiaries were born prior to the start of the projection period. However, variations in economic factors such as wage and price increases have significant effects on the estimates, even in the medium-range period. In general, the degree of confidence that can be placed in the assumptions and estimates is greater for the medium-range period than for the long-range period. Nonetheless, even for the medium-range period, the projections are only an indication of the trend and general range of future program experience. Appendix B contains a more detailed discussion of the effects on the estimates of varying economic, demographic, and programmatic assumptions.

Table 28 presents a comparison of the estimated cost rates and total income rates of the OASDI program, based on alternatives II-A and II-B. On the basis of alternative II-A, the program is projected to have annual surpluses beginning in 1984 and continuing until about 2020, after which the program is projected to have annual deficits. These deficits are projected to grow steadily to a peak of 1.21 percent of taxable payroll in 2035 and then fluctuate between 1.0 and 1.3 percent during the remainder of the long-range projection period. This pattern of annual surpluses and deficits produces a long-range actuarial surplus of 0.65 percent of taxable payroll, which consists of average surpluses of 2.40 and 0.72 percent of taxable payroll over the first and second 25-year subperiods, respectively, and an average deficit of 1.16 percent over the third 25-year subperiod.

On the basis of alternative II-B, annual surpluses are also projected, beginning in 1984 and continuing until about 2020, after which deficits

are projected for each year. These deficits grow more rapidly than those based on alternative II-A, and temporarily peak around 2035 at 2.16 percent of taxable payroll. Although the annual deficits in the remainder of the long-range period are significantly higher than those based on alternative II-A, they follow a similar pattern, fluctuating between 2.0 and 2.3 percent of taxable payroll. This pattern of annual surpluses and deficits produces a long-range actuarial deficit of 0.06 percent of taxable payroll, which consists of an average surplus of 2.01 percent of taxable payroll over the first 25-year subperiod, and average deficits of 0.05 and 2.14 percent over the second and third 25-year subperiods, respectively.

TABE 28.—COMPARISON OF ESTIMATED COST RATES AND INCOME RATES OF THE OASDI PROGRAM, ON THE BASIS OF ALTERNATIVES II-A AND II-B, CALENDAR YEARS 1984-2060
[As a percentage of taxable payroll]

Calendar year	Cost rate			Income rate			Balance
	OASI	DI	Total	Payroll tax	Taxation of benefits	Total	
Alternative II-A:							
1984	10.15	1.15	11.30	11.40	0.19	11.59	0.30
1985	10.03	1.08	11.11	11.40	.20	11.60	.49
1986	9.96	1.05	11.01	11.40	.21	11.61	.61
1987	9.92	1.02	10.93	11.40	.23	11.63	.69
1988	9.87	1.00	10.87	12.12	.24	12.36	1.49
1989	9.80	.98	10.79	12.12	.26	12.38	1.59
1990	9.77	.98	10.75	12.40	.27	12.67	1.92
1991	9.74	.98	10.72	12.40	.29	12.69	1.97
1992	9.68	.98	10.66	12.40	.31	12.71	2.05
1993	9.63	.98	10.61	12.40	.32	12.72	2.11
1994	9.48	.98	10.46	12.40	.38	12.78	2.32
1995	9.31	.99	10.30	12.40	.38	12.78	2.48
1996	9.11	.99	10.10	12.40	.37	12.77	2.67
1997	8.89	.99	9.88	12.40	.37	12.77	2.89
1998	8.73	.99	9.72	12.40	.37	12.77	3.05
1999	8.60	1.01	9.61	12.40	.36	12.76	3.15
2000	8.48	1.03	9.51	12.40	.36	12.76	3.25
2001	8.38	1.06	9.44	12.40	.36	12.76	3.33
2002	8.30	1.08	9.38	12.40	.36	12.76	3.39
2003	8.23	1.11	9.34	12.40	.36	12.76	3.42
2004	8.17	1.15	9.32	12.40	.37	12.77	3.44
2005	8.14	1.19	9.33	12.40	.37	12.77	3.44
2006	8.13	1.23	9.36	12.40	.37	12.77	3.41
2007	8.16	1.27	9.43	12.40	.38	12.78	3.35
2008	8.20	1.32	9.52	12.40	.38	12.78	3.26
2010	8.38	1.38	9.76	12.40	.40	12.80	3.04
2015	9.35	1.48	10.84	12.40	.46	12.86	2.02
2020	10.60	1.53	12.14	12.40	.53	12.93	.79
2025	11.75	1.61	13.36	12.40	.60	13.00	-.36
2030	12.48	1.58	14.05	12.40	.65	13.05	-1.00
2035	12.76	1.53	14.29	12.40	.68	13.08	-1.21
2040	12.64	1.55	14.19	12.40	.69	13.09	-1.10
2045	12.57	1.60	14.16	12.40	.71	13.11	-1.05
2050	12.67	1.60	14.28	12.40	.72	13.12	-1.16
2055	12.81	1.58	14.38	12.40	.72	13.12	-1.26
2060	12.85	1.56	14.41	12.40	.72	13.12	-1.28
25-year averages:							
1984-2008	9.07	1.06	10.14	12.22	.32	12.54	2.40
2009-2033	10.69	1.52	12.22	12.40	.54	12.94	.72
2034-2058	12.69	1.57	14.27	12.40	.71	13.11	-1.16
75-year average:							
1984-2058	10.82	1.39	12.21	12.34	.52	12.86	.65

TABE 28.—COMPARISON OF ESTIMATED COST RATES AND INCOME RATES OF THE OASDI PROGRAM, ON THE BASIS OF ALTERNATIVES II-A AND II-B, CALENDAR YEARS 1984-2060 (Cont.)
[As a percentage of taxable payroll]

Calendar year	Cost rate			Income rate			Balance
	OASI	DI	Total	Payroll tax	Taxation of benefits	Total	
Alternative II-B:							
1984	10.17	1.15	11.32	11.40	0.19	11.59	0.27
1985	10.06	1.09	11.15	11.40	.20	11.60	.45
1986	10.03	1.05	11.08	11.40	.22	11.62	.54
1987	10.04	1.03	11.06	11.40	.23	11.63	.57
1988	10.04	1.01	11.06	12.12	.25	12.37	1.31
1989	10.01	1.00	11.01	12.12	.26	12.38	1.37
1990	10.02	1.00	11.02	12.40	.28	12.68	1.66
1991	9.99	.99	10.99	12.40	.30	12.70	1.71
1992	9.98	1.00	10.98	12.40	.32	12.72	1.74
1993	9.95	1.00	10.95	12.40	.34	12.74	1.78
1994	9.84	1.01	10.85	12.40	.39	12.79	1.94
1995	9.71	1.02	10.73	12.40	.39	12.79	2.07
1996	9.54	1.02	10.56	12.40	.39	12.79	2.23
1997	9.35	1.02	10.37	12.40	.39	12.79	2.42
1998	9.21	1.03	10.24	12.40	.39	12.79	2.55
1999	9.11	1.05	10.16	12.40	.39	12.79	2.63
2000	9.01	1.07	10.08	12.40	.39	12.79	2.70
2001	8.92	1.10	10.02	12.40	.39	12.79	2.77
2002	8.85	1.13	9.98	12.40	.39	12.79	2.81
2003	8.79	1.16	9.95	12.40	.39	12.79	2.84
2004	8.74	1.20	9.94	12.40	.39	12.79	2.85
2005	8.70	1.24	9.94	12.40	.39	12.79	2.85
2006	8.70	1.29	9.98	12.40	.40	12.80	2.81
2007	8.72	1.33	10.05	12.40	.40	12.80	2.75
2008	8.77	1.38	10.15	12.40	.41	12.81	2.66
2010	8.95	1.44	10.40	12.40	.43	12.83	2.43
2015	9.99	1.55	11.54	12.40	.49	12.89	1.35
2020	11.31	1.61	12.92	12.40	.56	12.96	.04
2025	12.55	1.68	14.23	12.40	.64	13.04	-1.19
2030	13.36	1.65	15.01	12.40	.69	13.09	-1.91
2035	13.68	1.61	15.29	12.40	.73	13.13	-2.16
2040	13.59	1.63	15.22	12.40	.74	13.14	-2.07
2045	13.52	1.67	15.19	12.40	.76	13.16	-2.03
2050	13.63	1.68	15.31	12.40	.77	13.17	-2.14
2055	13.77	1.65	15.42	12.40	.77	13.17	-2.25
2060	13.81	1.63	15.45	12.40	.78	13.18	-2.27
25-year averages:							
1984-2008	9.45	1.10	10.54	12.22	.34	12.56	2.01
2009-2033	11.42	1.60	13.02	12.40	.57	12.97	-.05
2034-2058	13.65	1.65	15.29	12.40	.76	13.16	-2.14
75-year average:							
1984-2058	11.51	1.45	12.95	12.34	.56	12.90	-.06

The estimated average long-range income rates based on alternatives II-A and II-B are about 105.3 and 99.6 percent, respectively, of the estimated average long-range cost rates (of 12.21 and 12.95 percent of taxable payroll). Because the estimated average income rate based on alternative II-B is between 95 and 105 percent of the estimated average cost rate, the program is in close actuarial balance. Based on alternative II-A, the estimated average income rate exceeds 105 percent of the estimated average cost rate. Of course, these balances will shift slowly over time as the valuation period moves forward and near-term years of surplus are replaced by distant years of deficit.

The estimated cost rates increase rapidly after the medium-range period, primarily because the number of beneficiaries is projected to increase more rapidly than is 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 early 1960's will reach retirement age, and begin to receive benefits, while the relatively small number of persons born during the subsequent

periods of low fertility rates will comprise the labor force. During the last years of the projection period, the cost rates generally stabilize at a fairly high level, which reflects the stabilization in the projected ratio of the number of beneficiaries to the number of covered workers. Such stabilization results from the relatively smooth pattern of the assumed fertility rates. A comparison of the numbers of beneficiaries and covered workers, both historically and as projected on the basis of all four alternatives, is shown in table 29.

TABLE 29.—COMPARISON OF OASDI BENEFICIARIES AND COVERED WORKERS BY ALTERNATIVE, CALENDAR YEARS 1945-2060

Calendar year	Covered workers[1] (in thousands)	Beneficiaries[2] (in thousands)			Covered workers per OASDI beneficiary	Beneficiaries per 100 covered workers
		OASI	DI	Total		
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	20,157	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	[3]114,700	30,385	4,734	35,119	[3]3.3	[3]31
1981	[3]114,900	31,074	4,636	35,710	[3]3.2	[3]31
1982	[3]113,400	31,207	4,184	35,391	[3]3.2	[3]31
1983	[3]115,600	31,933	3,893	35,726	[3]3.2	[3]31
Alternative I:						
1984	120,863	32,320	3,777	36,097	3.3	30
1985	124,892	32,925	3,742	36,667	3.4	29
1990	137,143	35,854	3,736	39,590	3.5	29
1995	143,845	38,124	3,319	41,443	3.5	29
2000	152,023	38,913	3,652	42,565	3.6	28
2005	159,095	40,091	4,259	44,350	3.6	28
2010	162,630	42,949	4,998	47,947	3.4	29
2015	166,345	48,396	5,403	53,799	3.1	32
2020	168,361	54,679	5,593	60,272	2.8	36
2025	171,151	60,573	5,895	66,468	2.6	39
2030	175,153	64,539	5,842	70,381	2.5	40
2035	180,089	66,464	5,755	72,219	2.5	40
2040	185,293	66,321	5,910	72,231	2.6	39
2045	190,773	66,340	6,205	72,545	2.6	38
2050	196,702	67,337	6,437	73,774	2.7	38
2055	203,190	68,946	6,558	75,504	2.7	37
2060	210,043	70,604	6,702	77,306	2.7	37
Alternative II-A:						
1984	120,564	32,343	3,790	36,133	3.3	30
1985	124,087	32,991	3,785	36,776	3.4	30
1990	135,359	36,250	3,938	40,188	3.4	30
1995	141,643	38,718	4,094	42,812	3.3	30
2000	148,707	39,915	4,720	44,635	3.3	30
2005	154,760	41,388	5,638	47,026	3.3	30
2010	158,018	44,538	6,661	51,199	3.1	32
2015	158,912	50,325	7,197	57,522	2.8	36
2020	158,618	57,023	7,419	64,442	2.5	41
2025	158,451	63,432	7,769	71,201	2.2	45
2030	158,931	67,994	7,633	75,627	2.1	48
2035	159,926	70,493	7,442	77,935	2.1	49
2040	160,801	70,789	7,544	78,333	2.1	49
2045	161,577	71,106	7,784	78,890	2.0	49
2050	162,428	72,057	7,883	79,940	2.0	49
2055	163,585	73,130	7,811	80,941	2.0	49
2060	164,952	73,864	7,769	81,633	2.0	49
Alternative II-B:						
1984	120,446	32,343	3,790	36,133	3.3	30
1985	123,818	32,991	3,785	36,776	3.4	30
1990	134,486	36,248	3,937	40,185	3.3	30
1995	140,317	38,719	4,093	42,812	3.3	31
2000	146,126	39,915	4,717	44,632	3.3	31
2005	151,588	41,373	5,631	47,004	3.2	31
2010	154,762	44,521	6,650	51,171	3.0	33
2015	155,447	50,299	7,183	57,482	2.7	37
2020	155,145	56,981	7,402	64,383	2.4	41
2025	154,962	63,389	7,751	71,140	2.2	46
2030	155,420	67,949	7,613	75,562	2.1	49
2035	156,487	70,437	7,421	77,858	2.0	50
2040	157,350	70,732	7,523	78,255	2.0	50
2045	158,115	71,034	7,762	78,796	2.0	50
2050	158,942	71,987	7,861	79,848	2.0	50
2055	160,056	73,056	7,789	80,845	2.0	51

TABLE 29.—COMPARISON OF OASDI BENEFICIARIES AND COVERED WORKERS BY ALTERNATIVE, CALENDAR YEARS 1945-2060 (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 II-B: (Cont.)						
2060	161,383	73,784	7,748	81,532	2.0	51
Alternative III:						
1984	119,965	32,365	3,805	36,170	3.3	30
1985	121,454	33,049	3,835	36,884	3.3	30
1990	132,080	34,587	4,095	38,682	3.4	29
1995	137,573	39,325	4,639	43,964	3.1	32
2000	142,274	40,915	5,624	46,539	3.1	33
2005	146,570	42,801	6,925	49,726	2.9	34
2010	148,168	46,450	8,254	54,704	2.7	37
2015	146,824	52,864	8,917	61,781	2.4	42
2020	143,751	60,361	9,145	69,506	2.1	48
2025	140,066	67,796	9,503	77,299	1.8	55
2030	136,410	73,583	9,239	82,822	1.6	61
2035	132,946	77,371	8,884	86,255	1.5	65
2040	129,405	78,902	8,845	87,747	1.5	68
2045	125,030	80,245	8,897	89,142	1.4	71
2050	120,811	81,777	8,684	90,461	1.3	75
2055	116,874	82,622	8,233	90,855	1.3	78
2060	113,297	82,454	7,845	90,299	1.3	80

[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 less 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 56,068 as of June 30, 1983, and is estimated to be less than 500 by the turn of the century.

Table 29 shows that, even on the basis of alternative I, for which high fertility rates and small mortality reductions are assumed, the number of covered workers per beneficiary declines from the current level of 3.3 to an ultimate level of about 2.7. Based on alternative III, for which low fertility rates and substantial mortality reductions 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 2.0 workers per beneficiary. The impact of these changes on OASDI financing can be readily assessed by looking at the projected number of beneficiaries per hundred workers. Based on alternatives I, II-A, II-B, and III, this rises by the end of the long-range period to levels of 37, 49, 51, and about 79, respectively. These levels are, respectively, 23, 63, 70, and about 163 percent higher than the current level of 30 beneficiaries per 100 covered workers.

The implication of this demographic shift is a significantly higher cost rate during the last third of the long-range period than during the first two-thirds. Based on all but the most optimistic of the four alternative sets of assumptions used in this report, the OASDI program is estimated to have substantial annual deficits during the last 25 years. Therefore, at some point, either the costs would need to be reduced or the income would need to be raised in order to maintain actuarial balance.

Table 30 shows the OASDI cost rates on the basis of the four alternatives. Based on alternatives I, II-A, and II-B, the cost rates generally decline for the next 20 years. Based on alternative III, the cost rates fluctuate for about a decade before following a similar downward pattern. During the last few years of the medium-range period, the cost rates begin to rise slightly on the basis of all four alternatives.

After the medium-range period, on the basis of each alternative, the cost rates increase rapidly (because of the demographic shift discussed earlier). Based on alternative I, the cost rates peak around 2030, after which they decrease slightly through the end of the projection period. Based on alternatives II-A and II-B, they are fairly constant in 2035-50 before increasing thereafter through the end of the projection period. Based on alternative III, the cost rates continuously increase through the end of the long-range projection period.

The OASDI cost rates based on alternatives I and III differ by about 16 percentage points at the end of the long-range period, although by only 3.70 percentage points at the end of the medium-range period. The average long-range cost rate for the OASDI program varies from 10.01 percent on the basis of alternative I to 17.22 percent on the basis of alternative III, while the average medium-range cost rate varies much less—from 9.36 to 11.63 percent.

TABLE 30.—ESTIMATED COST RATES OF THE OASDI PROGRAM BY ALTERNATIVE, CALENDAR YEARS 1984-2060
[As a percentage of taxable payroll]

Calendar year	I	II-A	II-B	III
1984	11.24	11.30	11.32	11.48
1985	10.94	11.11	11.15	11.66
1986	10.73	11.01	11.08	11.65
1987	10.56	10.93	11.06	11.61
1988	10.42	10.87	11.06	11.63
1989	10.27	10.79	11.01	11.62
1990	10.04	10.75	11.02	11.64
1991	10.16	10.72	10.99	11.65
1992	9.94	10.66	10.98	11.84
1993	9.97	10.61	10.95	11.88
1994	9.58	10.46	10.85	11.86
1995	9.55	10.30	10.73	11.81
1996	9.31	10.10	10.56	11.70
1997	9.05	9.88	10.37	11.54
1998	8.86	9.72	10.24	11.46
1999	8.70	9.61	10.16	11.44
2000	8.56	9.51	10.08	11.43
2001	8.44	9.44	10.02	11.42
2002	8.35	9.38	9.98	11.43
2003	8.27	9.34	9.95	11.47
2004	8.22	9.32	9.94	11.51
2005	8.19	9.33	9.94	11.57
2006	8.19	9.36	9.98	11.67
2007	8.22	9.43	10.05	11.80
2008	8.27	9.52	10.15	11.97
2010	8.43	9.76	10.40	12.36
2015	9.25	10.84	11.54	13.98
2020	10.21	12.14	12.92	16.03
2025	11.01	13.36	14.23	18.24
2030	11.29	14.05	15.01	20.01
2035	11.15	14.29	15.29	21.33
2040	10.74	14.19	15.22	22.24
2045	10.43	14.16	15.19	23.32
2050	10.29	14.28	15.31	24.46
2055	10.22	14.38	15.42	25.43
2060	10.13	14.41	15.45	26.11
25-year averages:				
1984-2008	9.36	10.14	10.54	11.63
2009-2033	10.15	12.22	13.02	16.48
2034-2058	10.52	14.27	15.29	23.55
75-year average:				
1984-2058	10.01	12.21	12.95	17.22

Future OASDI cost rates will not necessarily fall within the range defined by the results based on 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.

The variations in cost rates based on the four alternative sets of assumptions are also reflected in varying costs as a percentage of Gross National Product (GNP) based on the four alternatives. Table 31 shows a comparison of the OASDI cost as a percentage of GNP on the basis of the four alternatives. Various similarities exist between the patterns of these cost percentages and the cost rates shown in the previous table. Based on all four alternatives, the percentages generally decline slowly until about 2005, after which they begin to rise. Shortly after the end of the medium-range period, based on each alternative, the percentages increase rapidiy (because of the demographic shift discussed earlier) and peak around 2030 based on alternative I and 2035 based on alternatives II-A and II-B, while continuing to increase through the end of the long-range projection period based on alternative III.

Another similarity is that the costs as a percentage of GNP on the basis of the four alternatives also differ by a relatively large amount at the end of the long-range period (about 4.6 percentage points between alternative I and III), although differing by a much smaller amount at the end of the medium-range period (1.34 percentage points). In addition, the average long-range cost as a percentage of GNP on the basis of the four alternatives varies by a relatively large amount (from 4.32 percent based on alternative I to 6.63 percent based on alternative III), while the average medium-range cost varies by a much smaller amount (from 4.11 to 4.97 percent).

TABLE 31.—ESTIMATED COST OF THE OASDI PROGRAM AS A PERCENTAGE OF GNP BY ALTERNATIVE, CALENDAR YEARS 1984-2060

Calendar year	I	II-A	II-B	III
1984	4.96	4.99	5.00	5.05
1985	4.81	4.89	4.90	5.13
1986	4.72	4.84	4.86	5.08
1987	4.65	4.81	4.85	5.05
1988	4.58	4.77	4.84	5.05
1989	4.51	4.73	4.81	5.04
1990	4.36	4.69	4.79	5.02
1991	4.46	4.67	4.77	5.03
1992	4.33	4.64	4.76	5.11
1993	4.37	4.61	4.74	5.12
1994	4.20	4.55	4.70	5.12
1995	4.18	4.47	4.63	5.08
1996	4.08	4.38	4.55	5.02
1997	3.97	4.28	4.46	4.94
1998	3.88	4.21	4.40	4.89
1999	3.82	4.16	4.36	4.87
2000	3.75	4.12	4.32	4.85
2001	3.70	4.08	4.28	4.83
2002	3.66	4.05	4.25	4.82
2003	3.63	4.03	4.24	4.82
2004	3.61	4.02	4.22	4.83
2005	3.59	4.01	4.21	4.84
2006	3.59	4.02	4.22	4.86
2007	3.60	4.04	4.24	4.90
2008	3.62	4.08	4.27	4.96
2010	3.69	4.17	4.36	5.09
2015	4.03	4.59	4.77	5.65
2020	4.43	5.09	5.27	6.35
2025	4.75	5.55	5.72	7.09
2030	4.85	5.79	5.94	7.63
2035	4.77	5.83	5.97	7.99
2040	4.57	5.73	5.86	8.17
2045	4.42	5.67	5.77	8.41
2050	4.34	5.66	5.73	8.65
2055	4.29	5.65	5.69	8.83
2060	4.23	5.60	5.62	8.90
25-year averages:				
1984-2008	4.11	4.41	4.55	4.97
2009-2033	4.40	5.11	5.28	6.48
2034-2058	4.45	5.70	5.79	8.45

TABLE 31.—ESTIMATED COST OF THE OASDI PROGRAM AS A PERCENTAGE OF GNP BY ALTERNATIVE, CALENDAR YEARS 1984-2060 (Cont.)

Calendar year	I	II-A	II-B	III
75-year average: 1984-2058	4.32	5.07	5.20	6.63

Table 32 shows a comparison of the estimated average cost rates and the estimated average total income rates, by trust fund. In the medium range, actuarial surpluses are projected for the OASI program, on the basis of all four alternatives; and for the DI program on the basis of all but alternative III. The combined OASDI medium-range actuarial surplus ranges from 0.97 percent of taxable payroll based on alternative III to 3.15 percent based on alternative I.

In the long range, a large deficit is projected for the OASI program based on alternative III, a minor deficit based on alternative II-B, and surpluses based on alternatives I and II-A. For the DI program, similar patterns are projected. The combined OASDI long-range actuarial balance ranges from a surplus of 2.75 percent of taxable payroll based on alternative I to a deficit of 4.12 percent based on alternative III.

TABLE 32.—COMPARISON OF ESTIMATED AVERAGE COST RATE WITH ESTIMATED AVERAGE TOTAL INCOME RATE BY ALTERNATIVE AND TRUST FUND
[As a percentage of taxable payroll]

Calendar years	Average cost rate			Average total income rate			Balance		
	OASI	DI	Total	OASI	DI	Total	OASI	DI	Total
Alternative I:									
1984-2008	8.48	0.88	9.36	11.25	1.26	12.51	+2.77	+0.38	+3.15
2009-2033	9.09	1.06	10.15	11.38	1.47	12.85	+2.29	+.41	+2.69
2034-2058	9.48	1.04	10.52	11.45	1.47	12.92	+1.97	+.43	+2.40
1984-2058	9.02	.99	10.01	11.36	1.40	12.76	+2.34	+.40	+2.75
Alternative II-A:									
1984-2008	9.07	1.06	10.14	11.27	1.27	12.54	+2.20	+.20	+2.40
2009-2033	10.69	1.52	12.22	11.45	1.49	12.94	+.76	-.04	+.72
2034-2058	12.69	1.57	14.27	11.61	1.50	13.11	-1.08	-.08	-1.16
1984-2058	10.82	1.39	12.21	11.45	1.42	12.86	+.63	+.03	+.65
Alternative II-B:									
1984-2008	9.45	1.10	10.54	11.29	1.27	12.56	+1.84	+.17	+2.01
2009-2033	11.42	1.60	13.02	11.49	1.49	12.97	+.06	-.11	-.05
2034-2058	13.65	1.65	15.29	11.66	1.50	13.16	-1.99	-.15	-2.14
1984-2058	11.51	1.45	12.95	11.48	1.42	12.90	-.03	-.03	-.06
Alternative III:									
1984-2008	10.32	1.31	11.63	11.32	1.28	12.59	+1.00	-.04	+.97
2009-2033	14.22	2.27	16.48	11.61	1.52	13.13	-2.61	-.75	-3.36
2034-2058	21.03	2.52	23.55	12.02	1.54	13.57	-9.00	-.98	-9.98
1984-2058	15.19	2.03	17.22	11.65	1.45	13.10	-3.54	-.59	-4.12

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

Table 33 shows the trust fund ratios for the OASI and DI programs, on the basis of all four alternatives. The OASI and DI ratios are projected to be fairly low for several years before increasing to very high levels thereafter. Based on alternative I, they increase throughout the long-range projection period to extremely high levels, around 1,800 percent for OASI and 2,800 percent for DI. In contrast, based on alternative III, the OASI ratio, after peaking around 250 percent, decreases rapidly until the fund is exhausted in 2027. Similarly, the DI ratio, after peaking at 82 percent, decreases rapidly until the fund is exhausted in 2008.

TABLE 33.—ESTIMATED TRUST FUND RATIOS BY ALTERNATIVE AND TRUST FUND, CALENDAR YEARS 1984-2060

Calendar year	Alternative I			Alternative II-A			Alternative II-B			Alternative III		
	OASI	DI	Total	OASI	DI	Total	OASI	DI	Total	OASI	DI	Total
1984	20	35	21	20	35	21	20	35	21	20	35	21
1985	22	29	23	21	27	22	21	27	21	19	25	20
1986	28	29	28	26	25	26	25	24	25	19	19	19
1987	31	34	31	28	25	27	27	23	27	18	18	18
1988	41	43	41	32	28	32	29	25	29	18	18	18
1989	58	84	61	44	60	46	39	55	41	19	19	19
1990	82	107	84	60	70	61	53	64	54	25	28	25
1991	106	141	109	78	95	80	68	86	69	33	40	34
1992	134	181	138	97	119	99	83	108	85	41	53	42
1993	159	215	164	116	143	119	99	130	101	48	64	49
1994	192	261	198	138	167	140	116	150	119	55	73	57
1995	224	308	231	162	191	165	135	171	138	63	80	65
1996	260	366	270	189	215	191	156	192	159	73	82	74
1997	301	430	313	220	239	221	180	212	183	84	82	84
1998	345	496	358	252	262	253	205	231	207	97	79	95
1999	391	547	404	285	278	284	231	244	232	110	74	106
2000	439	596	453	320	293	317	258	255	258	124	66	117
2001	488	666	504	355	323	352	284	280	284	137	69	128
2002	538	732	557	391	350	386	312	303	311	150	70	139
2003	590	790	610	428	371	421	340	321	338	163	67	150
2004	643	839	663	466	387	456	368	333	364	177	61	161
2005	697	881	716	503	399	490	397	342	390	190	52	170
2006	750	917	768	541	407	523	426	346	415	203	40	179
2007	801	947	817	576	411	554	453	348	439	215	25	187
2008	850	974	864	610	412	583	479	346	461	227	8	193
2010	939	1,032	949	671	413	634	525	341	500	244	[1]	200
2015	1,072	1,187	1,085	749	407	702	580	317	544	241	[1]	180
2020	1,122	1,362	1,147	750	394	705	565	284	530	177	[1]	108
2025	1,140	1,498	1,176	710	362	668	509	234	476	67	[1]	[1]
2030	1,172	1,718	1,224	662	340	626	438	185	411	[1]	[1]	[1]
2035	1,240	1,978	1,308	618	334	588	366	151	343	[1]	[1]	[1]
2040	1,363	2,177	1,441	591	320	562	301	116	281	[1]	[1]	[1]
2045	1,503	2,325	1,586	567	294	536	238	70	219	[1]	[1]	[1]
2050	1,631	2,495	1,720	534	265	504	170	17	154	[1]	[1]	[1]
2055	1,747	2,709	1,845	494	242	467	98	[1]	84	[1]	[1]	[1]
2060	1,869	2,920	1,976	454	226	429	22	[1]	11	[1]	[1]	[1]
Trust fund is projected to be exhausted in:	[2]	[2]	[2]	[2]	[2]	[2]	[2]	2050	[2]	2027	2008	2024

[1]The fund is projected to be exhausted.

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

Note: The OASDI ratios shown for years after the year in which a given fund is projected to be exhausted are theoretical and are shown for informational purposes only.

The actuarial balances shown in this report are similar to those shown in last year's report. Table 34 itemizes the reasons for the slight differences that do exist—together with their estimated cost effects—between the estimates based on alternative II-B in last year's report and those in this report.

TABLE 34.—CHANGE IN ESTIMATED MEDIUM-RANGE AND LONG-RANGE ACTUARIAL BALANCE ON THE BASIS OF ALTERNATIVE II-B BY TRUST FUND AND REASON FOR CHANGE
[As a percentage of taxable payroll]

Item	Medium range			Long range		
	OASI	DI	Total	OASI	DI	Total
Shown in last year's report:[1]						
Average total income rate	11.23	1.26	12.50	11.45	1.41	12.87
Average cost rate	9.61	1.06	10.66	11.46	1.38	12.84
Actuarial balance	+1.63	+.20	+1.83	-.01	+.04	+.02
Changes in actuarial balance due to changes in:						
Valuation date	+.12	+.00	+.12	-.02	-.00	-.03
Demographic assumptions	+.05	-.00	+.05	+.04	-.00	+.04
Disability assumptions	+.00	.-06	-.06	+.00	-.11	-.11
Unemployment assumptions	-.01	-.00	-.01	-.03	-.00	-.03
Other economic assumptions	+.06	+.00	+.06	+.02	+.00	+.02
Methods	-.01	+.01	-.00	+.04	+.03	+.06
All other factors	-.00	+.02	+.02	-.06	+.02	-.03
Total change in actuarial balance	+.21	-.03	+.18	-.02	-.07	-.08
Shown in this report:[2]						
Actuarial balance	+1.84	+.17	+2.01	-.03	-.03	-.06
Average cost rate	9.45	1.10	10.54	11.51	1.45	12.95
Average total income rate	11.29	1.27	12.56	11.48	1.42	12.90

[1]Cost rates, total income rates, and taxable payroll are calculated on the basis of the 1983 alternative II-B, which assumes ultimate annual increases of 5.5 percent in average wages in covered employment and 4.0 percent in the CPI, an ultimate annual unemployment rate of 5.5 percent, and an ultimate total fertility rate of 2.0 children per woman. The averages are computed over projection periods commencing with 1983.

[2]Cost rates, total income rates, and taxable payroll are calculated on the basis of the 1984 alternative II-B, which is described in the text. The averages are computed over projection periods commencing with 1984.

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

In changing from the valuation periods of last year's report, which were 1983-2007 and 1983-2057 for the medium-range and long-range periods, respectively, to the valuation periods of this report, 1984-2008 and 1984-2058, the year 1983 is replaced by 2008 in the medium range and by 2058 in the long range. In the medium-range period, the small estimated 1983 deficit shown in last year's report is replaced by the estimated surplus in 2008, thereby increasing the 25-year average surplus. In the long-range period, that 1983 deficit is replaced by the estimated larger deficit in 2058, thereby decreasing the 75-year actuarial balance.

Overall, ultimate mortality rates were lowered slightly, as compared with the ultimate rates used for last year's report, generally resulting in small increases in life expectancies at birth. The overall reduction, however, results from different changes in the specific mortality rates for ten separate groups of causes of death, with increases assumed for some groups and decreases for others. While, overall, mortality rates were lowered, the different changes for the aforementioned ten specific causes resulted in small decreases at younger ages and small increases at older ages, as compared with the corresponding ultimate rates used for last year's report. The lower mortality rates at younger ages result in a relatively larger working-age population than previously projected, while the higher rates at more advanced ages result in relatively fewer OASI beneficiaries. These changes result in increases in the actuarial

balances for the OASI program in both the medium-range and long-range periods. The lower mortality rates at younger ages result in a slightly larger increase in the number of DI beneficiaries than in the number of covered workers and thus decrease (although insignificantly) the DI actuarial balances.

The disability incidence rates assumed in this report were based on the higher average rates experienced in 1979-83 as compared with those in 1980-82, the base period for last year's report. Also, the ultimate rates in this report were assumed to be 25 percent higher than those experienced in the base period, instead of 15 percent higher as in last year's report. The change in the base period and the higher percentage increase over the base-period rates reflect both the increases actually experienced in 1983 and the assumption that future disability incidence rates will be higher than were assumed for last year's report. These two changes reduce both the medium-range and long-range actuarial balances.

The ultimate unemployment rate was changed from 5.5 percent in last year's report to 6.0 percent in this report. The unemployment rates assumed for years through 1991, however, are lower than those assumed in last year's report. These changes result in net reductions in both the medium-range and long-range actuarial balances.

Other economic assumptions were changed to reflect the unexpected strength and duration of the recovery that began in 1983. These changes result in an increase in the OASI actuarial balance over the medium-range period and, to a lesser extent, over the long-range period.

Changes were made in various methods used to estimate the actuarial balance of the OASDI program. These changes result in a minor decrease in the OASI medium-range actuarial balance, a minor increase in the DI medium-range actuarial balance, and small increases in both long-range actuarial balances.

Numerous minor changes were made in other items. These changes result in small decreases in the OASI actuarial balances and small increases in the DI actuarial balances.

VII. CONCLUSION

The actuarial estimates indicate that OASDI benefits can be paid on time well into the next century on the basis of all four sets of economic and demographic assumptions shown in this report. Over the next 75 years, the OASDI program is in close actuarial balance, based on the intermediate alternative II-B set of assumptions.

In the short range, the combined assets of the OASI and DI Trust Funds are estimated to increase each year, on the basis of alternatives I, II-A, and II-B. Based on the pessimistic alternative III assumptions, the combined assets, as a percentage of program outgo, are estimated to decline somewhat through the early part of 1988, before beginning to increase.

In the long range, the projections in this report indicate that the program has an average actuarial deficit of 0.06 percent of taxable payroll over the next 75 years, based on the intermediate alternative II-B assumptions. This represents a slight decline from the 0.02-percent surplus shown in the 1983 Annual Report. The program remains in close actuarial balance, however, based on alternative II-B, because the estimated average income rate over the next 75 years equals 99.6 percent of the estimated average cost rate. This is within the range of "close actuarial balance," which requires that, over the long-range period, the average income rate be between 95 and 105 percent of the average cost rate. However, the 25-year subperiods show a pattern of recurring deficits toward the end of the 75-year period. The actuarial deficit of 0.06 percent of taxable payroll consists of an average surplus of 2.01 percent of taxable payroll over the first 25-year subperiod, and average deficits of 0.05 and 2.14 percent over the second and third 25-year subperiods, respectively, of the 75-year projection period. Thus, the long-range actuarial balance will shift slowly over time as the valuation period moves forward and near-term years of surplus are replaced by distant years of deficit.

The estimates shown in this report are similar to those shown in the 1983 Annual Report, which, because of the enactment of the Social Security Amendments of 1983, indicated a substantially improved financial condition for the OASDI program than was indicated in earlier reports. The short-range estimates in this report, on the basis of alternatives I, II-A, and II-B, show somewhat higher levels of combined OASI and DI assets after 1984 than were shown in the 1983 report. This improvement reflects the stronger economic recovery in 1983 and early 1984 than was expected when the 1983 report was prepared.

The effect of the more favorable economic experience was partly offset by somewhat higher disability incidence rates and lower termination rates than had been projected and by somewhat lower trust fund growth in 1983 than had been estimated. The recent disability experience is also reflected in lower estimates of DI assets than were shown in last year's report. The relatively small decline in the OASDI long-range actuarial balance based on alternative II-B, as noted above, is primarily attributable to the assumption of continued higher disability incidence rates. The change in the actuarial balance also reflects the effects of several other factors, including the change in the valuation period—from 1983-2057, as used for last year's report, to 1984-2058.

As in the 1983 report, the trust fund levels are estimated to remain relatively low through 1987. The trust fund levels based on alternative III in this report are lower after 1985 than were estimated in last year's report. Benefits could still be paid on time during the short-range projection period, based on alternative III, but the margins for safety would be very small. Thus, if economic conditions in 1984-87 are worse, in terms of their effects on the trust funds, than those assumed for the pessimistic alternative III set, the OASDI program could again experience financial difficulties in the near future. After 1987, the program's ability to withstand temporary economic downturns is projected to improve steadily.

The estimates based on alternatives I, II-A, and II-B indicate that the growth in the combined assets of the OASI and DI Trust Funds would require the complete repayment, by early 1987, of the $12.4 billion owed to the HI Trust Fund. Based on alternative III, no repayment of the amounts owed would be required by law prior to 1988, but full repayment is assumed to occur in the first half of 1988—in six equal monthly payments. Without such earlier repayment, the HI Trust Fund would be depleted in 1988, on the basis of the alternative III assumptions.

Based on alternatives I, II-A, and II-B, complete repayment of the $5.1 billion owed to the DI Trust Fund by the OASI Trust Fund would be made in 1988, before the statutory deadline for repayment of such amounts. On the basis of alternative III, repayments beginning in 1986 would be necessary to enable the continued payment of DI benefits. The repayments are assumed to occur during 1985-89, in such a manner as to keep the two trust funds in a roughly equivalent financial position, based on alternative III.