

IV. SUMMARY OF THE OPERATIONS OF THE OLD-AGE AND SURVIVORS INSURANCE AND DISABILITY INSURANCE TRUST FUNDS, FISCAL YEAR 1987

A. OLD-AGE AND SURVIVORS INSURANCE TRUST FUND

A statement of the income and disbursements of the Federal Old-Age and Survivors Insurance Trust Fund in fiscal year 1987, and of the assets of the fund at the beginning and end of the fiscal year, is presented in table 2.

TABLE 2.—STATEMENT OF OPERATIONS OF THE OASI TRUST FUND
DURING FISCAL YEAR 1987
[In thousands]

Total assets, September 30, 1986.....		\$37,519,378
Receipts:		
Contributions:		
Appropriations:		
Employment taxes.....	\$192,601,710	
Tax credits.....	1,652,655	
Total appropriations.....	194,254,366	
Deposits arising from State agreements.....	5,324,577	
Payment from general fund of the Treasury representing employee-employer contributions on deemed wage credits for military service in 1987.....	348,391	
Gross contributions.....	199,927,333	
Less payment to the general fund of the Treasury for contributions subject to refund.....	373,170	
Net contributions.....		199,554,163
Income from taxation of benefit payments:		
Withheld from benefit payments to non-resident aliens.....	66,717	
All other, not subject to withholding ¹	3,258,000	
Total income from taxation of benefits.....		3,322,717
Reimbursement from general fund of the Treasury for costs of payments to uninsured persons who attained age 72 before 1968.....		69,394
Investment income and interest adjustments:		
Interest on investments.....	4,496,366	
Interest on transfers from the general fund account for the Supplemental Security Income program due to adjustment in allocation of administrative expenses.....	1,098	
Gross investment income and interest adjustments.....	4,497,463	
Less interest on interfund transfers due to adjustment in allocation of administrative expenses.....	2,510	
Less interest on general fund advance tax transfers.....	625,017	
Net investment income and interest adjustments.....		3,869,936
Income from merger of the Northern Mariana Islands Social Security Retirement Fund with the United States Social Security program.....		29,434
Gifts.....		454
Total receipts.....		206,846,097

APPENDIX A.—ASSUMPTIONS AND METHODS UNDERLYING THE ACTUARIAL ESTIMATES

This appendix describes the assumptions and methods which underlie the actuarial estimates in this report. Unless specifically stated otherwise, the assumptions and methods were used for each of the four alternatives and for both the short-range and long-range periods. Some of the economic and demographic assumptions which vary by alternative are summarized in the section entitled "Actuarial Estimates." Further details about the assumptions, methods, and actuarial estimates are contained in Actuarial Studies published by the Office of the Actuary, Social Security Administration, and are available upon request.

TOTAL POPULATION

Projections were made of the population in the Social Security coverage area by age, sex, and marital status as of January 1 of each year 1987 through 2065. The projections started with the United States population, including armed forces overseas, on January 1, 1986, based on estimates by the Bureau of the Census. This population estimate was adjusted for net census undercount and increased by the estimated populations in the geographic areas covered by the OASDI program but not included in the U.S. population. The population was then projected using assumed rates of birth and death and assumed levels of net immigration.

Historically, fertility rates in the U.S. have fluctuated widely. The total fertility rate is defined to be the average number of children that would be born to a woman in her lifetime if she were to experience the birth rates by age observed in, or assumed for, the selected year, and if she were to survive the entire child-bearing period. The total fertility rate decreased from 3.3 after World War I to 2.1 during the Great Depression, rose to 3.7 in 1957, and then fell to 1.7 in 1976. Since then, it has risen slightly and has been between 1.8 and 1.9 children per woman since 1978.

These variations in fertility rates have resulted from changes in social attitudes, economic conditions, and the use of birth-control methods. Future fertility rates may be expected to remain close to recent levels. The recent historical and projected trends in certain population characteristics are consistent with a continued relatively low fertility rate. These trends include the rising percentages of women who have never married, of women who are divorced, and of young women who are in the labor force. Based on consideration of these factors, ultimate total fertility rates of 2.2, 1.9, and 1.6 children per woman were selected for alternatives I, II-A and II-B, and III, respectively. These compare with rates of 2.3, 2.0, and 1.6 children per woman used for the same alternatives in the 1987 Trustees Reports. For each alternative, the total fertility rate is assumed to reach its ultimate level in 2012. These ultimate values can be compared to those used by the Bureau of the Census for its latest series of population projections. Those fertility rates range from 2.3 to 1.6, with an intermediate assumption of 1.9.¹ A rate of 2.1 would

¹U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 952, "Projections of the Population of the United States By Age, Sex, and Race: 1983-2080," U.S. Government Printing Office, Washington, D.C., May 1984.

ultimately result in a nearly constant population if net immigration were zero and if death rates were constant at levels close to current U.S. experience.

Historically, death rates in the U.S. have steadily declined. The age-sex-adjusted death rate—which is the crude rate that would occur in the enumerated total population as of April 1, 1980, if that population were to experience the death rates by age and sex for the selected year—declined at an average rate of 1.2 percent per year between 1900 and 1986. These reductions in death rates have resulted from many factors, including increased medical knowledge, increased availability of health-care services, and improvements in personal health-care practices such as diet and exercise. Based on consideration of the likelihood of continued progress in these and other areas, three alternative sets of ultimate annual percentage reductions in central death rates by sex and cause of death were selected for 2012 and later. The intermediate set, which is used for both alternatives II-A and II-B, is considered most likely to be realized. The average annual percentage reductions used for alternative I are smaller than those for alternatives II-A and II-B, while those used for alternative III are greater. Between 1987 and 2012, these reductions in central death rates for alternatives II-A and II-B are assumed to change gradually from the average annual reductions by age, sex, and cause of death observed between 1968 and 1985, to the ultimate annual percentage reductions by sex and cause of death assumed for 2012 and later. Alternative I reductions are assumed to change gradually from 50 percent of the average annual reductions observed between 1968 and 1985, while alternative III reductions are assumed to change gradually from 150 percent of the average annual reductions observed between 1968 and 1985. The age-sex-adjusted death rate (for all causes combined) declined at an average rate of 1.6 percent per year between 1968 and 1985.

After adjustment for changes in the age-sex distribution of the population, death rates were projected to decline at an average annual rate of about 0.3 percent, 0.6 percent, and 1.1 percent between 1987 and 2062 for alternatives I, II-A and II-B, and III, respectively. Death rates for AIDS were included based on estimates through 1991 prepared by the Centers for Disease Control, Public Health Service. Until more data are available to assess the prevalence of this disease, an assumption has been adopted that no new infections with the Human Immunodeficiency Virus (HIV) will occur after 1991.

Beginning with 1988, net immigration is assumed to be 750,000, 600,000, and 450,000 persons per year for alternatives I, II-A and II-B, and III, respectively. Of these net numbers of immigrants, 450,000, 400,000, and 350,000, respectively, are assumed to be legal, and the remainders are assumed to be other-than-legal. For 1986 and 1987, the net legal immigration is assumed to be 400,000 persons per year and, consistent with the estimates of other-than-legal immigration made by the Bureau of the Census since the 1980 Census, net other-than-legal immigration is assumed to be 200,000 persons per year. For the 1987 Trustees Report net legal immigration was assumed to be 600,000, 400,000, and 200,000 persons per year for alternatives I, II-A and II-B,

and III, respectively. No assumption was made for other-than-legal immigration for the 1987 Trustees Report.

Table A1 shows the projected population as of July 1 by broad age group, for the four alternatives. Because eligibility for many types of OASDI benefits depends on marital status, the population was projected by marital status, as well as by age and sex. Marriage and divorce rates were based on recent data from the National Center for Health Statistics.

TABLE A1.—SOCIAL SECURITY AREA POPULATION AS OF JULY 1 AND DEPENDENCY RATIOS, BY ALTERNATIVE AND BROAD AGE GROUP, CALENDAR YEARS 1950-2065

Calendar year	Population (in thousands)				Dependency ratio	
	Under 20	20-64	65 and over	Total	Aged ¹	Total ²
Past experience:						
1950	53,895	92,739	12,752	159,386	0.138	0.719
1960	72,989	99,842	17,250	190,081	.173	.904
1965	80,072	104,850	19,068	203,990	.182	.946
1970	80,885	113,073	20,892	214,850	.185	.900
1975	78,787	122,639	23,227	224,653	.189	.832
1980	74,928	134,203	26,115	235,246	.195	.753
1985	73,167	144,994	28,966	247,127	.200	.704
Alternative I:						
1990	74,255	152,778	31,952	258,985	.209	.695
1995	76,635	159,546	34,004	270,185	.213	.693
2000	78,577	166,796	34,782	280,155	.209	.680
2005	79,496	174,918	35,694	290,108	.204	.659
2010	81,017	181,561	38,221	300,799	.211	.657
2015	83,670	184,756	43,461	311,887	.235	.688
2020	86,855	185,573	49,979	322,408	.269	.737
2025	89,755	185,146	57,099	332,000	.308	.793
2030	92,017	186,289	62,421	340,727	.335	.829
2035	93,976	190,446	64,454	348,877	.338	.832
2040	96,410	195,821	64,476	356,708	.329	.822
2045	99,274	200,995	64,168	364,437	.319	.813
2050	102,164	205,254	64,940	372,357	.316	.814
2055	104,805	209,818	66,183	380,806	.315	.815
2060	107,294	215,198	67,507	390,000	.314	.812
2065	109,888	221,287	68,696	399,872	.310	.807
Alternatives II-A and II-B:						
1990	74,009	152,556	31,999	258,565	.210	.695
1995	75,456	158,910	34,348	268,713	.216	.691
2000	75,914	165,782	35,601	277,297	.215	.673
2005	74,805	173,514	37,024	285,343	.213	.644
2010	73,753	179,600	40,022	293,375	.223	.633
2015	73,674	181,595	45,743	301,012	.252	.658
2020	74,250	180,603	52,799	307,652	.292	.703
2025	74,610	177,778	60,549	312,936	.341	.760
2030	74,411	175,907	66,524	316,842	.378	.801
2035	73,965	176,456	69,119	319,539	.392	.811
2040	73,758	177,862	69,605	321,225	.391	.806
2045	73,866	178,618	69,644	322,128	.390	.803
2050	74,030	177,894	70,659	322,583	.397	.813
2055	74,024	176,963	71,975	322,962	.407	.825
2060	73,874	176,782	72,903	323,539	.412	.830
2065	73,746	177,243	73,357	324,345	.414	.830
Alternative III:						
1990	73,756	152,335	32,046	258,137	.210	.695
1995	74,237	158,263	34,675	267,174	.219	.688
2000	73,162	164,729	36,367	274,258	.221	.665
2005	69,987	172,037	38,291	280,315	.223	.629
2010	66,399	177,552	41,839	285,790	.236	.610
2015	63,757	178,335	48,218	290,309	.270	.628
2020	62,027	175,521	56,083	293,631	.320	.673
2025	60,294	170,291	64,836	295,421	.381	.735
2030	58,204	165,459	71,937	295,600	.435	.787
2035	56,047	162,551	75,637	294,235	.465	.810
2040	54,029	160,253	77,169	291,452	.482	.819
2045	52,323	156,999	78,128	287,450	.498	.831
2050	50,797	151,849	79,925	282,570	.526	.861
2055	49,270	146,174	81,778	277,222	.559	.897
2060	47,711	141,403	82,648	271,762	.584	.922
2065	46,206	137,557	82,589	266,352	.600	.936

¹Population aged 65 and over, divided by population aged 20-64.

²Sum of population aged 65 and over, and population under age 20, divided by population aged 20-64.

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

COVERED POPULATION

The number of covered workers in a year is defined as the number of persons who, at any time during the year, have OASDI taxable earnings. Projections of the numbers of covered workers were made by applying projected coverage rates to the projected Social Security area population. The coverage rates—i.e., the number of covered workers in the year, as a percentage of the population as of July 1—were determined by age and sex using projected labor force participation rates and unemployment rates, and their historical relationships to coverage rates. In addition, the coverage rates were adjusted to reflect the increase in coverage of Federal civilian employment that will result from the 1983 Social Security Amendments and the subsequent opportunity offered to Federal civilian employees, who were hired before 1983, to become covered under the OASDI program.

Labor force participation rates were projected by age and sex, taking into account projections of the percentage of the population that is married, the percentage of the population that is disabled, the number of children in the population, the level of retirement benefits, and the state of the economy. All of these factors vary by alternative. For men, the projected age-adjusted labor force participation rates for the year 2065 for alternatives I, II-A, II-B, and III are 1.1, 1.3, 1.5, and 1.9 percentage points lower, respectively, than the 1987 level of 76.7 percent. For women, the projected age-adjusted labor force participation rates increase for all of the alternatives. The projected rates for 2065 are 3.4, 2.2, 1.7, and 0.4 percentage points, respectively, above the 1987 level of 56.1 percent.

The total age-sex-adjusted unemployment rate averaged 6.0 percent for the 30 years 1958-87 and 7.1 percent for the 10 years 1978-87. The ultimate total age-sex-adjusted unemployment rate is assumed to be 5.0, 5.5, 6.0, and 7.0 percent for alternatives I, II-A, II-B, and III, respectively. For alternatives I, II-A, and II-B, the unemployment rate is assumed to decline gradually from its 1987 level of 6.2 percent, reaching its ultimate level by 2000. For alternative III, the unemployment rate is assumed to peak in 1990 and again in 1992, because of assumed recessions, and thereafter to decline gradually, reaching its ultimate level by 2000.

The projected age-adjusted coverage rate for men changes from its 1987 level of 75.4 percent to 76.1, 75.6, 75.0, and 73.8 percent in 2065 on the basis of alternatives I, II-A, II-B, and III, respectively. For women, it increases from its 1987 level of 57.3 percent to 61.4, 60.1, 59.4, and 57.7 percent for alternatives I, II-A, II-B, and III, respectively.

AVERAGE EARNINGS AND INFLATION

Future increases in average earnings and in the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W, hereinafter denoted as "CPI") will directly affect the OASDI program. Average earnings in covered employment for each year have a direct effect on the size of the taxable payroll and on the future level of average benefits. Increases in the CPI directly affect the automatic cost-of-living benefit increases, while inflation in general affects the nominal levels of average

earnings, GNP, and taxable payroll. In addition, increases in average wages in the U.S. economy directly affect the indexation, under the automatic-adjustment provisions in the law, of the benefit formulas, the contribution and benefit base, the exempt amounts under the retirement earnings test, the amount of earnings required for a quarter of coverage, and under certain circumstances, the automatic cost-of-living benefit increases.

Increases in average earnings were projected in two components—average earnings of wage-and-salary workers, usually referred to as average wages (and shown in table 10 of this report), and average net earnings of self-employed persons. Each of these was subdivided into increases in real average earnings and increases in the CPI. For simplicity, real-earnings increases are expressed in the form of real-earnings differentials—i.e., the percentage increase in average nominal earnings, minus the percentage increase in the CPI.

The assumed ultimate increases in average real earnings are based on analysis of trends in productivity gains and the factors linking productivity gains with increases in average real earnings. For the 30 years 1957-86, annual increases in productivity for the total U.S. economy averaged 1.7 percent, the result of average annual increases of 2.7, 1.6, and 0.9 percent for the 10-year periods 1957-66, 1967-76, and 1977-86, respectively. Meanwhile, the average annual rate of change in average real earnings was an increase of 0.9 percent for the 30 years 1957-86, the result of average annual increases of 2.3 and 0.5 percent, and an average annual decrease of 0.2 percent, respectively, for the aforementioned 10-year periods. The change in the linkage between annual increases in productivity and real earnings averaged 0.8 percent for the 30 years 1957-86, and 0.4, 1.1, and 1.0 percent, respectively, for the aforementioned 10-year periods. The change in the linkage reflects changes in such factors as the average number of hours worked per year, the extent to which workers share in the value of production, and the proportion of employee compensation paid as wages.

The ultimate annual increases in productivity for all sectors—wage-and-salary workers, self-employed persons, and the total economy—are assumed to be 2.3, 2.0, 1.7, and 1.5 percent for alternatives I, II-A, II-B, and III, respectively. The corresponding ultimate annual rates of change in the linkage for wage and salary workers are assumed to be 0.0 percent for alternative I and declines of 0.2, 0.35, and 0.6 percent for alternatives II-A, II-B, and III, respectively. The resulting ultimate real-wage differentials are 2.4, 1.9, 1.4, and 0.9 percent. Ultimate annual declines in the linkage for self-employed persons are smaller because the proportion of reported compensation that is considered earnings remains constant. As a result, ultimate real-earnings differentials for the self-employed are assumed to be higher than for wage-and-salary workers. The corresponding ultimate real-earnings differentials for wage-and-salary workers and self-employed persons, combined, are slightly higher than those assumed for wage-and-salary workers only.

For alternative II-A, the CPI is assumed to increase ultimately at an annual rate of 3.0 percent. For alternative II-B, the CPI is assumed to increase ultimately at an annual rate of 4.0 percent, which is somewhat

lower than the average annual increase of 4.7 percent experienced between 1957 and 1987. The ultimate increases in the average annual CPI for alternatives I and III of 2.0 percent and 5.0 percent, respectively, were chosen to include a reasonable range of possible values. Ultimate annual increases in the GNP price deflator are assumed to be the same, for each alternative, as for the CPI.

The ultimate increases in average annual wages in covered employment are assumed to be 4.4, 4.9, 5.4, and 5.9 percent, for alternatives I, II-A, II-B, and III, respectively. These were obtained, for each alternative, by adding the assumed annual percentage increase in the CPI to the real-wage differential. Ultimate increases in average wages and earnings for the U.S. economy are very similar to those assumed for average wages in covered employment.

TAXABLE PAYROLL AND TAXES

The taxable payroll is that amount which, when multiplied by the combined employee-employer tax rate, yields the total amount of taxes paid by employees, employers, and the self-employed. The taxable payroll is important not just in estimating OASDI income, but also in determining income and cost rates, and actuarial balances. These terms are defined in the introduction to the section entitled "Actuarial Estimates."

In practice, the taxable payroll is calculated as a weighted average of the earnings on which employees, employers, and self-employed persons make contributions to the OASDI program. The weighting takes into account the lower tax rates, as compared to the combined employee-employer rate, which apply to multiple-employer "excess wages," and which did apply, before 1984, to net earnings from self-employment and, before 1988, to tips. For 1984 and later, the amounts of earnings for employees, employers, and the self-employed were projected separately. For 1983 and later, taxable payroll also includes deemed wage credits for military service. Estimates of taxable earnings for employees, employers, and the self-employed were developed from corresponding estimates of earnings in the U.S. economy, by means of factors which adjust for various differences in these measures. The factors adjust total U.S. earnings by removing earnings from noncovered employment, adding earnings from various outlying areas which are covered by Social Security but are not included in published "U.S." data, and removing earnings above the taxable earnings base.

Estimates of taxes collected were developed from the corresponding estimates of taxable earnings by applying the employee, employer, or self-employed tax rate, and by taking into account the lag time from the incurrence of tax liability to the collection of taxes.

INSURED POPULATION

There are three types of insured status under the OASDI program: fully, currently, and disability. Fully insured status is required of an aged worker for eligibility to a primary retirement benefit and for the eligibility of the worker's spouse and children to auxiliary benefits. Fully insured status is also required of a deceased worker for the eligibility of the worker's survivors to benefits (with the exception of child survivors and parents of eligible child survivors, in which cases the deceased worker is required to have had either currently insured status or fully insured status). Disability insured status, which is more restrictive than fully insured status, is required of a disabled worker for eligibility to a primary disability benefit and for the eligibility of the worker's spouse and children to auxiliary benefits.

Projections of the percentage of the population that is fully insured were made by age and sex, based on past and projected coverage rates, the requirement for fully insured status, and their historical relationships to fully insured rates. Currently insured status was disregarded for purposes of these estimates, because the number of cases in which eligibility for benefits is based solely on currently insured status is relatively small. Projections of the percentage of fully insured persons who are also disability insured were made by age and sex based on past and projected coverage rates, the requirement for disability insured status, and their historical relationships. Finally, the fully insured and disability insured populations were developed from the projected total population by applying the appropriate percentages.

Under this procedure, the percentage of the Social Security area population aged 62 and over that is fully insured is projected to increase from 75.5 on January 1, 1988, to 90.4, 90.1, 89.9, and 89.5 on January 1, 2061, based on alternatives I, II-A, II-B, and III, respectively. The increase for females is projected to be much greater than the increase for males. Based on alternative II-B, for example, the percentage for males is projected to increase only slightly during this period from 92.4 to 94.0, while that for females is projected to increase more substantially from 63.3 to 86.7. The percentage of fully insured persons under the normal retirement age who are disability insured is projected to change only slightly from 85.7 on January 1, 1988, to 86.0, 85.6, 85.4, and 84.9 on January 1, 2061, for alternatives I, II-A, II-B, and III, respectively.

The fully insured population by age and sex was further subdivided by marital status, by using the variation in labor force participation rates by marital status to estimate the variation in coverage rates by marital status. These coverage rates were then used to estimate the variation in the fully insured rates by marital status.

OLD-AGE AND SURVIVORS INSURANCE BENEFICIARIES

The numbers of OASI beneficiaries were projected for each type of benefit separately, by the sex of the worker on whose earnings the benefits are based, and by the age of the beneficiary. For selected types of benefits, the numbers of beneficiaries were also projected by marital status.

In the short-range period, the numbers of retired-worker beneficiaries were developed by applying award rates to the numbers of persons who are insured but not yet retired, and by applying termination rates to the numbers of persons already receiving retired-worker benefits. In the long range, the numbers of retired-worker beneficiaries who are not converted from disabled-worker beneficiaries were projected as a percentage of the aged fully insured population less those persons entitled to disability or widow(er)'s benefits (i.e., the exposed population). The percentages for ages 70 and over are assumed to be 100, because the retirement earnings test and delayed retirement credit do not apply after age 70. For 1990, the retired-worker beneficiaries as a percentage of the exposed population for ages 65 through 69 are assumed to increase, reflecting the change effective then in benefit withholding under the retirement earnings test. The percentages for ages 62 through 69 are assumed to change for two reasons. They were adjusted upward at a decreasing rate until 1997, thus continuing the trend toward earlier retirement. They were also adjusted, however, in the long-range period, for each year of birth, as a function of the ratio of the monthly benefit amount payable at each age of entitlement to the amount payable at age-70 entitlement. This resulted in a gradual downward adjustment as the increases in the delayed retirement credit become effective and, beginning in 2000, during the years in which the normal retirement age is scheduled to increase. The net effect of these two adjustments is to increase the percentages at ages 62 through 69 into the 1990s and then to decrease the percentages. Ultimate percentages are assumed to be reached in 2030. The numbers of retired-worker beneficiaries who are converted from disabled-worker beneficiaries were calculated separately in a manner consistent with the calculation of disabled-worker beneficiaries.

The numbers of aged-spouse beneficiaries were estimated from the population projected by age and sex. The benefits of aged-spouse beneficiaries are based on the earnings records of their husbands or wives, who are referred to as "wage earners." In the short-range period, a regression equation was used to project the number of aged-spouse beneficiaries, as a proportion of the aged female or male population not receiving retired-worker or aged-widow(er) benefits. In the long-range period, aged-spouse beneficiaries were estimated from the population projected by age, sex, and marital status. To the numbers of spouses aged 62 and over in the population, a series of factors were applied, representing the probabilities that the spouse and the wage earner meet all of the conditions of eligibility—i.e., the probabilities that (1) the wage earner is 62 or over, (2) the wage earner is insured, (3) the wage earner is receiving benefits, (4) the spouse is not receiving a benefit for the care of an entitled child, (5) the spouse is not insured, (6) the spouse is not eligible to receive a significant government pension based on earnings in noncovered employment, and (7) a residual factor.

In addition, the same factors were applied to the numbers of divorced persons aged 62 and over in the population, with three differences. First, an additional factor is required to reflect the probability that the person's former wage-earner spouse is still alive (otherwise, the person may be entitled to a divorced widow(er)'s benefit). Second, a factor is required

to reflect the probability that the marriage to the wage-earner spouse was at least 10 years in duration. Third, factor (3) was not applied because, effective for January 1985, a divorced person generally need not wait to receive benefits until the former wage-earner spouse is receiving benefits.

The projected numbers of children under age 18, and students aged 18, who are eligible for benefits as children of retired-worker beneficiaries, were based on the projected numbers of children in the population. In the short-range period, a factor was applied, representing the probability that both parents are alive. A regression equation was then used to project the number of children of retired-worker beneficiaries. In the long-range period, entitled children were projected separately by sex of the wage-earner parent. To the numbers of children in the population, factors were applied representing the probabilities that the parent is alive, aged 62 or over, insured, and receiving a retired-worker benefit. Another factor was applied representing the probability that the child is not entitled to a benefit based on the other parent's earnings. For children aged 18, a factor was applied representing the probability that the child is attending a secondary school. The numbers of disabled children aged 18 and over of retired-worker beneficiaries were projected from the adult population in a similar manner, with the inclusion of a factor representing the probability of being disabled since childhood.

In the short-range period, the numbers of young-spouse beneficiaries were projected as a proportion of the projected numbers of child beneficiaries who are either under age 16 or disabled. In the long-range period, young-spouse beneficiaries were projected as a proportion of the projected numbers of child beneficiaries of retired workers, taking into account projected changes in average family size.

The numbers of aged-widow(er) beneficiaries were projected from the population by age and sex. In the short-range period, a regression equation projected the number of aged-widow(er) beneficiaries, as a proportion of the aged female or male population not receiving retired-worker or aged-spouse benefits. In the long-range period, aged-widow(er) beneficiaries were projected from the population by age, sex, and marital status. Four factors were applied to the numbers of widow(er)s in the population aged 60 and over. These factors represent the probabilities that (1) the deceased wage-earner was fully insured at death, (2) the widow(er) is not receiving a benefit for the care of an entitled child, (3) the widow(er) is not fully insured, and (4) the widow(er)'s benefits are not withheld because of receipt of a significant government pension based on earnings in noncovered employment. In addition, some insured widow(er)s who had not applied for their retired-worker benefits are assumed to receive widow(er) benefits. Also, the same factors were applied to the numbers of divorced persons aged 60 and over in the population, with additional factors representing the probability that the person's former wage-earner spouse is deceased and that the marriage was at least 10 years in duration.

In the short-range period, the numbers of disabled-widow(er) beneficiaries were estimated as a proportion of the female or male population aged 50-64. In the long-range period, the numbers were projected for

bers of such beneficiaries entitled on December 31, 1987, by adding new entitlements and subtracting terminations. The starting numbers of entitled disabled-worker beneficiaries were estimated by age, sex, and duration of entitlement, from the tabulated number of disabled-worker beneficiaries in current payment status on December 31, 1987. The numbers of new entitlements during each year were projected by applying assumed disability incidence rates. In the short-range period, an age-adjusted rate was applied to the total age-adjusted disability insured population for each sex. In the long-range period, incidence rates by age and sex were applied to the projected disability insured population (excluding those already entitled to disabled-worker benefits) to obtain new entitlements. The numbers of terminations were projected by applying assumed termination rates to the disabled-worker population. In the short-range period, overall termination rates for each sex were projected based on recent experience and on expected changes in the administration of the DI program. In the long-range period, the numbers of terminations were projected by applying assumed death and recovery rates, by age, sex, and duration of entitlement, to the entitled disabled-worker population, and adding the number of disabled-worker beneficiaries automatically converted to retired-worker beneficiaries at the normal retirement age (currently, age 65).

The disability incidence rates, which declined during 1975-82, increased during 1983-86, and remained steady in 1987, are assumed to resume the increasing trend in 1988. The rates are assumed to increase significantly faster for males than for females during the next decade, as workers afflicted by AIDS become disabled-worker beneficiaries. The incidence rates increase through 2005, when they reach ultimate levels which, for alternatives II-A and II-B, are about 20 percent for males and 28 percent for females higher than the corresponding average rates for 1983-85. This produces age-adjusted rates in 2005 of 5.2 per thousand for males and 3.6 per thousand for females, and an age-sex-adjusted rate of 4.6 per thousand. These adjusted rates are approximately the same as those used in the four prior reports. For the other alternatives, the disability incidence rates are assumed to follow patterns through time similar to the one for alternatives II-A and II-B. For alternative I, the ultimate levels are assumed to be higher by about 5 percent for both males and females than the average for 1983-85. For alternative III, the ultimate levels are assumed to be higher by about 43 percent for males and 53 percent for females.

The overall termination rates were projected quarterly in the short-range period. For alternatives II-A and II-B, the rates were projected to increase from the relatively low levels of 1984-86, to levels comparable to the average experienced over the last decade. For alternative III, the termination rates increase more slowly and to lower levels, whereas for alternative I the termination rates increase more quickly and to higher levels.

In the long-range period, the death and recovery rates were projected by age, sex, and duration of entitlement. For all alternatives, the death rates are assumed to decline steadily throughout the 75-year projection period. For alternatives II-A and II-B, they reach levels in 2065

approximately 30 percent lower for males and approximately 20 percent lower for females than those experienced by disabled-worker beneficiaries during 1977-80, the most recent period for which detailed data exist. The recovery rates are assumed to increase from 1987 levels until 1995, when they attain ultimate levels about 15 percent higher than those experienced during the period 1977-80, thereby allowing for the estimated effect of the periodic reviews required by provisions of law first enacted in 1980, and amended in 1983 and 1984.

For alternative I, the death rates in 2065 are assumed to be roughly 20 percent lower for males and approximately 10 percent lower for females than those experienced by disabled-worker beneficiaries during 1977-80, and the recovery rates are assumed to increase to levels 30 percent higher than those of the same period. For alternative III, the death rates in 2065 are assumed to be about 45 percent lower for males and approximately 35 percent lower for females than those experienced during 1977-80, and recovery rates are assumed to be equal to those experienced during 1977-80.

In the short-range period, the projected numbers of children under age 18, students aged 18, and disabled children aged 18 and over, who are eligible for benefits as children of disabled-worker beneficiaries, were projected by applying quarterly award and termination rates. Awards to the three categories of child beneficiaries were based on the numbers of awards to disabled-worker beneficiaries.

In the long-range period, the projected numbers of minor-child and student beneficiaries were based on the projected numbers of children in the population by age. To these numbers of children were applied factors representing the probability that either of their parents is insured and disabled. The numbers of disabled children aged 18 and over were projected as a function of the numbers of disabled-worker beneficiaries and the size of the adult population.

In the short-range period, the numbers of young-spouse beneficiaries were projected by applying quarterly award and termination rates, where awards were based on the numbers of awards to child beneficiaries who are either under age 16 or disabled. The numbers of aged-spouse beneficiaries were also projected by applying quarterly award and termination rates, where awards were based on the number of awards to disabled-worker beneficiaries.

In the long-range period, the numbers of young-spouse beneficiaries were projected as a proportion of the projected numbers of child beneficiaries who are either under age 16 or disabled, taking into account projected changes in family size. The numbers of aged-spouse beneficiaries were projected as a proportion of the numbers of disabled-worker beneficiaries, based on recent experience and allowing for projected changes in marriage rates.

Table A3 shows the projected numbers of beneficiaries under the DI program.

TABLE A3.—DI BENEFICIARIES WITH MONTHLY BENEFITS IN CURRENT-PAYMENT STATUS AS OF DECEMBER 31 BY ALTERNATIVE, CALENDAR YEARS 1960-2065
[in thousands]

Calendar year	Disabled workers	Auxiliaries		Total
		Wife-husband	Child	
Past experience:				
1960	455	77	155	687
1965	988	193	558	1,739
1970	1,493	283	889	2,665
1975	2,489	453	1,411	4,352
1980	2,859	462	1,358	4,678
1985	2,656	306	945	3,907
1986	2,727	301	965	3,993
1987	2,785	291	968	4,045
Alternative I:				
1988	2,829	287	971	4,087
1989	2,849	284	972	4,105
1990	2,869	280	971	4,120
1995	3,081	285	1,026	4,393
2000	3,504	282	1,081	4,868
2005	4,076	302	1,126	5,504
2010	4,715	318	1,148	6,181
2015	5,080	308	1,168	6,555
2020	5,247	308	1,203	6,758
2025	5,559	337	1,257	7,153
2030	5,483	325	1,298	7,106
2035	5,443	317	1,327	7,087
2040	5,533	313	1,358	7,203
2045	5,799	329	1,398	7,526
2050	5,966	341	1,444	7,751
2055	6,079	351	1,491	7,921
2060	6,188	356	1,535	8,080
2065	6,376	365	1,577	8,317
Alternative II-A:				
1988	2,844	289	976	4,108
1989	2,887	288	983	4,158
1990	2,932	286	988	4,206
1995	3,263	299	1,075	4,637
2000	3,847	324	1,178	5,349
2005	4,542	363	1,226	6,131
2010	5,322	398	1,232	6,952
2015	5,772	401	1,226	7,399
2020	5,974	414	1,231	7,619
2025	6,317	455	1,254	8,026
2030	6,202	441	1,268	7,912
2035	6,123	430	1,272	7,825
2040	6,184	422	1,270	7,876
2045	6,424	441	1,275	8,140
2050	6,512	452	1,284	8,248
2055	6,484	454	1,293	8,230
2060	6,428	449	1,299	8,175
2065	6,460	448	1,303	8,211
Alternative II-B:				
1988	2,844	289	976	4,108
1989	2,887	288	983	4,158
1990	2,932	286	988	4,206
1995	3,262	299	1,075	4,636
2000	3,844	323	1,177	5,345
2005	4,537	362	1,224	6,124
2010	5,313	398	1,230	6,941
2015	5,760	401	1,222	7,383
2020	5,959	414	1,227	7,600
2025	6,299	455	1,250	8,004
2030	6,183	442	1,264	7,889
2035	6,103	431	1,267	7,800
2040	6,162	423	1,266	7,851
2045	6,401	443	1,270	8,114
2050	6,489	454	1,279	8,221
2055	6,461	455	1,288	8,204
2060	6,404	450	1,294	8,149
2065	6,437	450	1,298	8,185
Alternative III:				
1988	2,881	293	990	4,164
1989	2,967	296	1,011	4,274
1990	3,056	299	1,030	4,384
1995	3,646	335	1,198	5,179
2000	4,334	381	1,315	6,030
2005	5,188	448	1,366	7,002
2010	6,154	509	1,348	8,011
2015	6,717	524	1,304	8,545
2020	6,964	544	1,271	8,780
2025	7,353	595	1,258	9,205
2030	7,187	574	1,243	9,005

TABLE A3.—DI BENEFICIARIES WITH MONTHLY BENEFITS IN CURRENT-PAYMENT STATUS AS OF DECEMBER 31 BY ALTERNATIVE, CALENDAR YEARS 1960-2065 (Cont.)
(In thousands)

Calendar year	Disabled workers	Auxiliaries		Total
		Wife-husband	Child	
Alternative III: (Cont.)				
2035	7,059	554	1,219	8,833
2040	7,084	537	1,185	8,807
2045	7,299	555	1,154	9,008
2050	7,284	560	1,127	8,972
2055	7,064	548	1,103	8,715
2060	6,786	524	1,077	8,387
2065	6,621	508	1,051	8,180

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

AVERAGE BENEFITS

Average benefits were projected by type of benefit based on recent historical averages, projected average Primary Insurance Amounts (PIAs), and projected ratios of average benefits to average PIAs. Average PIAs were calculated from projected distributions of beneficiaries by duration from year of award, average awarded PIAs, and increases thereto since the year of award, because of automatic benefit increases, recomputations to reflect additional covered earnings, and other factors. Average awarded PIAs were calculated from projected earnings histories, which were developed from the actual earnings histories associated with a sample of awards made in 1983.

For several types of benefits—retired-worker, aged-spouse, and aged-widow(er) benefits—the percentage of the PIA that is payable depends on the age at initial entitlement to benefits. Projected ratios of average benefits to average PIAs for these types of benefits were based on projections of age distributions at initial entitlement.

BENEFIT PAYMENTS

For each type of benefit, benefit payments were calculated as the product of a number of beneficiaries and a corresponding average monthly benefit. In the short-range period, benefit payments were calculated on a quarterly basis. In the long-range period, all benefit payments were calculated on an annual basis, using the number of beneficiaries on December 31. These amounts were adjusted to include retroactive payments to newly awarded beneficiaries, and other amounts not reflected in the regular monthly benefit payments.

Lump-sum death payments were calculated as the product of (1) the number of such payments, which was projected on the basis of the assumed death rates, the projected fully insured population, and the estimated percentage of the fully insured population that would qualify for benefits, and (2) the amount of the lump-sum death payment, which is \$255.

ADMINISTRATIVE EXPENSES

The projection of administrative expenses through 1997 was based on assumed increases in average wages, increases in the CPI, and increases in the number of beneficiaries. For years after 1997, administrative expenses are assumed to increase with the numbers of beneficiaries and

with average earnings in covered employment, taking into account assumed increases in productivity.

RAILROAD RETIREMENT FINANCIAL INTERCHANGE

The effect of the financial interchange with the Railroad Retirement program was evaluated on the basis of trends similar to those used in estimating the cost of OASDI benefits. The resulting effect was annual short-range costs of about \$3-4 billion and an average annual long-range cost of 0.03 percent of taxable payroll to the OASDI program.

BENEFITS TO UNINSURED PERSONS

The law provides for special monthly cash payments to certain uninsured persons who attained age 72 before 1968 or who have 3 quarters of coverage for each year after 1966 and before the year of attainment of age 72. The numbers of such uninsured persons were projected based on an extrapolation of the historical survival rate of the members of that group. The benefit payable to these uninsured persons is a fixed amount which increases by the percentage benefit increase applicable to regular OASDI benefits. These payments are made from the OASI Trust Fund, which is then reimbursed from the general fund of the Treasury for the costs (including administrative expenses and interest) associated with providing payments to those persons with fewer than 3 quarters of coverage. The nonreimbursable payments are assumed to be insignificant after 1997. Neither the reimbursable payments nor the associated reimbursements are reflected in the cost rates or the income rates. These amounts are reflected, however, in tables which show trust fund operations.

MILITARY-SERVICE TRANSFERS

As a result of the 1983 amendments, the OASI and DI Trust Funds received lump-sum payments, in May 1983, for the cost (including administrative expenses) of providing additional benefit payments resulting from noncontributory wage credits for military service performed prior to 1957. Adjustments to the payments were made in 1985, and additional adjustments will be made in 1990 and every fifth year thereafter. The adjustments for 1990 were estimated based on the change in interest rates since the determination of the adjustments in 1985. No adjustments after 1990 would be due unless actual interest rates are different from those assumed, or changes are made in the methods used to determine the military-service transfers.

INCOME FROM TAXATION OF BENEFITS

The OASI and DI Trust Funds are credited with the additional income taxes attributable to the partial taxation of OASDI benefit payments. For the short-range period, income to the trust funds from such taxation was estimated by applying the following two factors to total OASI and DI benefit payments: (1) the percentage of benefit payments that is taxable, and (2) the average tax rate applicable to those benefits. For the long-range period, income to the trust funds from such

taxation was projected by applying factors representing the ratio of such income to total OASDI benefit payments under varying levels of income thresholds. Because the thresholds are constant in the law, their values in relation to future income and benefit levels decline. These factors were projected based on the results of a model developed by the Office of Tax Analysis, Department of the Treasury, relating OASDI benefit payments to total personal income for a sample of recent tax returns.

APPENDIX B.—SENSITIVITY ANALYSIS

This appendix presents estimates which illustrate the sensitivity of the level-financing estimates to changes in selected individual assumptions. Although the estimates based on the four alternative sets of assumptions illustrate variations that result from different combinations of assumptions, they do not show variations that result from changes in any single assumption. In this sensitivity analysis, alternative II-B is used as the reference point, and one assumption at a time within that alternative is varied. Similar variations in the selected assumptions within the other alternatives would result in similar relative variations in the estimates.

Each table which follows shows the effects of changing the particular assumption under consideration on the OASDI income rates, cost rates, and actuarial balances. Because the income rate varies only slightly with changes in assumptions, it is not considered in the discussion of the tables. The change in each of the actuarial balances is approximately equal to the change in the corresponding cost rate, but in the opposite direction.

TOTAL FERTILITY RATE

Table B1 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II-B with various assumptions about the ultimate total fertility rate. These assumptions are that the ultimate total fertility rate will be 1.6 children per woman (as assumed for alternative III), 1.9 (as assumed for alternatives II-A and II-B), and 2.2 (as assumed for alternative I). The rate is assumed to change gradually from its current level and to reach the various ultimate values in 2012.

TABLE B1.—ESTIMATED OASDI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON ALTERNATIVE II-B WITH VARIOUS FERTILITY ASSUMPTIONS
(As a percentage of taxable payroll)

Calendar years	Ultimate total fertility rate ¹		
	1.6	1.9	2.2
Income rate:			
25-year: 1988-2012	12.78	12.78	12.78
50-year: 1988-2037	12.88	12.87	12.87
75-year: 1988-2062	12.96	12.94	12.92
Cost rate:			
25-year: 1988-2012	10.51	10.54	10.58
50-year: 1988-2037	12.45	12.34	12.25
75-year: 1988-2062	14.03	13.52	13.04
Actuarial balance:			
25-year: 1988-2012	+2.27	+2.24	+2.21
50-year: 1988-2037	+43	+53	+62
75-year: 1988-2062	-1.07	-58	-12

¹The total fertility rate for any year is the average number of children who would be born to a woman in her lifetime if she were to experience the birth rates by age observed in, or assumed for, the selected year, and if she were to survive the entire child-bearing period. The ultimate total fertility rate is assumed to be reached in 2012.

For the 25-year period, the cost rate for the three fertility assumptions varies by only 0.07 percent of taxable payroll. In contrast, the 75-year cost rate varies over a wide range, decreasing from 14.03 to 13.04 percent, as the assumed ultimate total fertility rate increases from 1.6 to 2.2. Similarly, while the 25-year actuarial balance varies by only 0.06 percent of taxable payroll, the 75-year actuarial balance varies over a much wider range—from -1.07 to -0.12 percent.

During the 25-year period, changes in fertility affect the working population only slightly and result in relatively minor changes in the number of child beneficiaries. Hence, the program cost is affected only slightly. For the 75-year long-range period, however, changes in fertility have a relatively greater impact on the labor force than on the beneficiary population. As a result, an increase in fertility significantly reduces the cost rate. Each increase of 0.1 in the ultimate total fertility rate increases the long-range actuarial balance by about 0.16 percent of taxable payroll.

DEATH RATES

Table B2 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II-B with various assumptions about future reductions in death rates. The analysis was developed by varying the percentage decrease assumed to occur during 1988-2062 in the age-sex-adjusted death rate. The decreases assumed for this period are about 20 percent (as assumed for alternative I), 36 percent (as assumed for alternatives II-A and II-B), and 56 percent (as assumed for alternative III).

TABLE B2.—ESTIMATED OASDI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON ALTERNATIVE II-B WITH VARIOUS DEATH-RATE ASSUMPTIONS
[As a percentage of taxable payroll]

Calendar years	Reduction in death rates ¹		
	20 percent	36 percent	56 Percent
Income rate:			
25-year: 1988-2012	12.78	12.78	12.79
50-year: 1988-2037	12.86	12.87	12.89
75-year: 1988-2062	12.91	12.94	12.98
Cost rate:			
25-year: 1988-2012	10.39	10.54	10.70
50-year: 1988-2037	11.96	12.34	12.81
75-year: 1988-2062	12.90	13.52	14.38
Actuarial balance:			
25-year: 1988-2012	+2.39	+2.24	+2.09
50-year: 1988-2037	+90	+53	+08
75-year: 1988-2062	+01	-58	-140

¹The measure of the reduction in death rates is the decrease in the age-sex-adjusted death rate during 1988-2062.

The variation in cost for the 25-year period¹ is less pronounced than the variation for the 75-year period because the decreases in death rates are assumed to occur gradually and because of the specific changes in the age composition of the population that are projected to occur. The 25-year cost rate increases from 10.39 percent (for 20-percent lower ultimate death rates) to 10.70 percent (for 56-percent lower ultimate rates). The long-range cost rate increases from 12.90 to 14.38 percent. The actuarial balance decreases from +2.39 to +2.09 percent for the 25-year period, and from +0.01 to -1.40 percent for the 75-year period.

Lower death rates cause both the income (as well as taxable payroll) and the outgo of the OASDI program to be higher than they would otherwise be. The relative increase in outgo, however, exceeds the relative increase in taxable payroll. For any given year, reductions in the death rates for people who have attained the normal retirement age (people whose death rates are the highest) increase the number of retired-worker beneficiaries (and, therefore, the amount of retirement benefits paid) without adding significantly to the number of covered

workers (and, therefore, to the taxable payroll). Although reductions for people aged 50 to normal retirement age do result in significant increases to the taxable payroll, those increases are not large enough to offset the sum of the additional retirement benefits mentioned above and the disability benefits paid to additional beneficiaries in this pre-retirement age group. At ages under 50, death rates are so low that even substantial reductions would not result in significant increases in the numbers of covered workers or beneficiaries. Consequently, if death rates for all ages are lower by the same relative amount, outgo increases at a rate greater than the rate of growth in payroll, thereby resulting in higher cost rates. Each additional 10-percent reduction in the age-sex-adjusted death rate assumed to occur in 1988-2062, relative to the 36-percent reduction assumed for alternative II-B, decreases the long-range actuarial balance by about 0.40 percent of taxable payroll.

NET IMMIGRATION

Table B3 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II-B with various assumptions about the magnitude of net immigration. These assumptions are that the annual net immigration will be 450,000 persons (as assumed for alternative III), 600,000 persons (as assumed for alternatives II-A and II-B), and 750,000 persons (as assumed for alternative I).

TABLE B3.—ESTIMATED OASDI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES,
BASED ON ALTERNATIVE II-B WITH VARIOUS NET-IMMIGRATION ASSUMPTIONS
(As a percentage of taxable payroll)

Calendar years	Net immigration per year		
	450,000	600,000	750,000
Income rate:			
25-year: 1988-2012	12.78	12.78	12.78
50-year: 1988-2037	12.88	12.87	12.87
75-year: 1988-2062	12.95	12.94	12.93
Cost rate:			
25-year: 1988-2012	10.61	10.54	10.48
50-year: 1988-2037	12.48	12.34	12.21
75-year: 1988-2062	13.68	13.52	13.36
Actuarial balance:			
25-year: 1988-2012	+2.18	+2.24	+2.30
50-year: 1988-2037	+0.40	+0.53	+0.66
75-year: 1988-2062	-0.73	-0.58	-0.43

For all three periods, the cost rate decreases with increasing rates of net immigration. For the 25-year period, the cost rate decreases from 10.61 percent of taxable payroll (for annual net immigration of 450,000 persons) to 10.48 percent (for annual net immigration of 750,000 persons). For the 50-year period, it decreases from 12.48 percent to 12.21 percent, and for the 75-year period, it decreases from 13.68 percent to 13.36 percent. The actuarial balance increases from +2.18 to +2.30 percent for the 25-year period, from +0.40 to +0.66 for the 50-year period, and from -0.73 to -0.43 percent for the 75-year period.

The cost rate decreases with increasing rates of net immigration because immigration occurs at relatively young ages, thereby increasing the numbers of covered workers earlier than the numbers of beneficiaries. Each additional group of 100,000 immigrants relative to the 600,000 net immigration assumed for alternative II-B, increases the long-range actuarial balance by about 0.10 percent of taxable payroll.

REAL-WAGE DIFFERENTIAL

Table B4 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II-B with various assumptions about the real-wage differential. These assumptions are that the ultimate real-wage differential will be 0.9 percentage point (as assumed for alternative III), 1.4 percentage points (as assumed for alternative II-B), 1.9 percentage points (as assumed for alternative II-A), and 2.4 percentage points (as assumed for alternative I). In each case, the ultimate annual increase in the CPI is assumed to be 4.0 percent (as assumed for alternative II-B), yielding ultimate percentage increases in average annual wages in covered employment of 4.9, 5.4, 5.9, and 6.4 percent, respectively.

TABLE B4.—ESTIMATED OASDI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON ALTERNATIVE II-B WITH VARIOUS REAL-WAGE ASSUMPTIONS
[As a percentage of taxable payroll]

Calendar years	Ultimate percentage increase in wages-CPI ¹			
	4.9-4.0	5.4-4.0	5.9-4.0	6.4-4.0
Income rate:				
25-year: 1988-2012	12.80	12.78	12.76	12.75
50-year: 1988-2037	12.89	12.87	12.85	12.83
75-year: 1988-2062	12.96	12.94	12.92	12.89
Cost rate:				
25-year: 1988-2012	10.89	10.54	10.20	9.86
50-year: 1988-2037	12.82	12.34	11.87	11.40
75-year: 1988-2062	14.04	13.52	12.99	12.46
Actuarial balance:				
25-year: 1988-2012	+1.90	+2.24	+2.57	+2.89
50-year: 1988-2037	+ .07	+ .53	+ .98	+1.43
75-year: 1988-2062	-1.08	-.58	-.07	+ .44

¹The first value in each pair is the assumed ultimate annual percentage increase in average wages in covered employment. The second value is the assumed ultimate annual percentage increase in the Consumer Price Index. The difference between the two values is the real-wage differential.

For the 25-year period, the cost rate decreases from 10.89 percent (for a real-wage differential of 0.9 percentage point) to 9.86 percent (for a differential of 2.4 percentage points). For the 50-year period, it decreases from 12.82 to 11.40 percent, and for the 75-year period it decreases from 14.04 to 12.46 percent. The actuarial balance increases from +1.90 to +2.89 percent for the 25-year period, from +0.07 to +1.43 for the 50-year period, and from -1.08 to +0.44 percent for the 75-year period.

The cost rate decreases with increasing real-wage differentials, because the higher real-wage levels increase the taxable payroll, while benefit increases are not affected. Although the initial benefit levels are higher because of the higher wages, these increases are more than offset by the increases in the taxable payroll of future workers. Each 0.5-percentage-point increase in the assumed real-wage differential increases the long-range actuarial balance by about 0.51 percent of taxable payroll.

CONSUMER PRICE INDEX

Table B5 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II-B with various assumptions about the rate of increase for the Consumer Price Index (CPI). These assumptions are that the ultimate annual increase in the CPI will be 2.0 percent (as assumed for alternative I), 3.0 percent (as assumed for alternative II-A), 4.0 percent (as assumed for alternative II-B), 5.0 percent (as assumed for alternative III), and 6.0 percent. In

each case, the ultimate real-wage differential is assumed to be 1.4 percentage points (as assumed for alternative II-B), yielding ultimate percentage increases in average annual wages in covered employment of 3.4, 4.4, 5.4, 6.4, and 7.4 percent, respectively.

TABLE B5.—ESTIMATED OASDI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON ALTERNATIVE II-B WITH VARIOUS CPI-INCREASE ASSUMPTIONS [As a percentage of taxable payroll]

Calendar years	Ultimate percentage increases in wages-CPI ^a				
	3.4-2.0	4.4-3.0	5.4-4.0	6.4-5.0	7.4-6.0
Income rate:					
25-year: 1988-2012.....	12.80	12.79	12.78	12.77	12.77
50-year: 1988-2037.....	12.89	12.88	12.87	12.86	12.85
75-year: 1988-2062.....	12.97	12.95	12.94	12.93	12.91
Cost rate:					
25-year: 1988-2012.....	10.77	10.65	10.54	10.44	10.33
50-year: 1988-2037.....	12.70	12.52	12.34	12.17	12.00
75-year: 1988-2062.....	13.95	13.73	13.52	13.31	13.11
Actuarial balance:					
25-year: 1988-2012.....	+2.03	+2.14	+2.24	+2.34	+2.44
50-year: 1988-2037.....	+ .20	+ .36	+ .53	+ .69	+ .85
75-year: 1988-2062.....	-.98	-.78	-.58	-.39	-.20

^aThe first value in each pair is the assumed ultimate annual percentage increase in average wages in covered employment. The second value is the assumed ultimate annual percentage increase in the Consumer Price Index.

For all three periods, the cost rate decreases with greater assumed rates of increase in the CPI. For the 25-year period, the cost rate decreases from 10.77 (for CPI increases of 2.0 percent) to 10.33 percent (for CPI increases of 6.0 percent). For the 50-year period, it decreases from 12.70 to 12.00 percent, and for the 75-year period, it decreases from 13.95 to 13.11 percent. The actuarial balance increases from +2.03 to +2.44 percent for the 25-year period, from +0.20 to +0.85 for the 50-year period, and from -0.98 to -0.20 percent for the 75-year period.

The patterns described above result primarily from the time lag between the effects of the CPI changes on taxable payroll and on benefit payments. When assuming a greater rate of increase in the CPI (in conjunction with a constant real-wage differential), the effect on taxable payroll of the implied greater rate of increase in average wages is experienced immediately, while the effect on benefits of the greater rate of increase in the CPI is experienced with a lag of about 1 year. In addition, the effect on benefits of the greater rate of increase in average wages is experienced no sooner than 2 years later. Thus, the higher taxable payrolls have a stronger effect than the higher benefits, thereby resulting in lower cost rates. The effect of each 1.0-percentage-point increase in the rate of change assumed for the CPI is an increase in the long-range actuarial balance of about 0.20 percent of taxable payroll.

REAL-INTEREST RATE

Table B6 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II-B with various assumptions about the annual real-interest rate. These assumptions are that the ultimate annual real-interest rate will be 1.0 percent, 1.5 percent (as assumed for alternative III), 2.0 percent (as assumed for alternative II-B), 2.5 percent (as assumed for alternative II-A), and 3.0 percent (as assumed for alternative I). In each case, the ultimate annual increase in the CPI is assumed to be 4.0 percent (as assumed for alternative II-B), resulting in ultimate annual yields of 5.0, 5.6, 6.1, 6.6, and 7.1 percent, respectively.

TABLE B6.—ESTIMATED OASDI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON ALTERNATIVE II-B WITH VARIOUS REAL-INTEREST ASSUMPTIONS
[As a percentage of taxable payroll]

Calendar years	Ultimate annual real-interest rate				
	1.0 percent	1.5 percent	2.0 percent	2.5 percent	3.0 percent
Income rate:					
25-year: 1988-2012.....	12.78	12.78	12.78	12.78	12.79
50-year: 1988-2037.....	12.88	12.88	12.87	12.87	12.86
75-year: 1988-2062.....	12.97	12.95	12.94	12.93	12.91
Cost rate:					
25-year: 1988-2012.....	10.54	10.54	10.54	10.55	10.55
50-year: 1988-2037.....	12.63	12.48	12.34	12.21	12.08
75-year: 1988-2062.....	14.04	13.78	13.52	13.26	13.01
Actuarial balance:					
25-year: 1988-2012.....	+2.24	+2.24	+2.24	+2.24	+2.24
50-year: 1988-2037.....	+ .26	+ .40	+ .53	+ .66	+ .79
75-year: 1988-2062.....	-1.07	-.82	-.58	-.34	-.10

For the 25-year period, the cost rate increases with increasing real-interest rates from 10.54 percent (for an ultimate real-interest rate of 1.0 percent) to 10.55 percent (for an ultimate real-interest of 3.0 percent). For the 50-year period, it decreases from 12.63 to 12.08 percent, and for the 75-year period, it decreases from 14.04 to 13.01 percent. The actuarial balance remains at +2.24 percent for the 25-year period, increases from +0.26 to +0.79 percent for the 50-year period, and increases from -1.07 to -0.10 percent for the 75-year period.

DISABILITY INCIDENCE RATES

Table B7 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II-B with various assumptions about future disability incidence rates. These assumptions are that the ultimate annual age-sex-adjusted disability incidence rate will be about 5 percent higher for both men and women than the average of the corresponding annual rates experienced during 1983-85 (as assumed for alternative I), about 20 percent higher for men and 28 percent higher for women than such experience (as assumed for alternatives II-A and II-B), and about 43 percent higher for men and 53 percent higher for women than such experience (as assumed for alternative III). The rates are assumed to change gradually from their current levels and to reach their ultimate values in 2005.

TABLE B7.—ESTIMATED OASDI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON ALTERNATIVE II-B WITH VARIOUS DISABILITY INCIDENCE ASSUMPTIONS
[As a percentage of taxable payroll]

Calendar years	Disability incidence rates based on alternative—		
	I	II-A and II-B	III
Income rate:			
25-year: 1988-2012.....	12.78	12.78	12.78
50-year: 1988-2037.....	12.87	12.87	12.87
75-year: 1988-2062.....	12.94	12.94	12.94
Cost rate:			
25-year: 1988-2012.....	10.47	10.54	10.65
50-year: 1988-2037.....	12.24	12.34	12.49
75-year: 1988-2062.....	13.40	13.52	13.69
Actuarial balance:			
25-year: 1988-2012.....	+2.31	+2.24	+2.13
50-year: 1988-2037.....	+ .64	+ .53	+ .38
75-year: 1988-2062.....	-.46	-.58	-.74

For the 25-year period, the cost rate increases with increasing disability incidence rates from 10.47 percent (for the relatively low rates assumed for alternative I) to 10.65 percent (for the relatively high rates assumed for alternative III). For the 50-year period, it increases from 12.24 to 12.49 percent, and for the 75-year period, it increases from 13.40 to 13.69 percent. The actuarial balance decreases from +2.31 to +2.13 percent for the 25-year period, from +0.64 to +0.38 percent for the 50-year period, and from -0.46 to -0.74 percent for the 75-year period.

DISABILITY TERMINATION RATES

Table B8 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II-B with various assumptions about future disability termination rates.

For all four alternatives, death-termination rates by age and sex are assumed to decline throughout the 75-year period. At the end of that period, they reach levels that, in comparison to the corresponding annual rates experienced during the base period, 1977-80, are about 10 percent lower for alternative I, about 25 percent lower for alternatives II-A and II-B, and about 50 percent lower for alternative III.

For all four alternatives, ultimate recovery-termination rates by age and sex are assumed to be attained in 1990. For alternative I, they are about 30 percent higher than the corresponding rates experienced during the base period. For alternative III, they are about the same as the base-period rates. For alternatives II-A and II-B, such rates are about 15 percent higher than those experienced in the base period, in order to reflect the effects of the additional periodic reviews that began in 1981.

TABLE B8.—ESTIMATED OASDI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON ALTERNATIVE II-B WITH VARIOUS DISABILITY TERMINATION ASSUMPTIONS
(As a percentage of taxable payroll)

Calendar years	Disability termination rates based on alternative—		
	I	II-A and II-B	III
Income rate:			
25-year: 1988-2012	12.78	12.78	12.78
50-year: 1988-2037	12.87	12.87	12.87
75-year: 1988-2062	12.94	12.94	12.94
Cost rate:			
25-year: 1988-2012	10.52	10.54	10.57
50-year: 1988-2037	12.31	12.34	12.39
75-year: 1988-2062	13.47	13.52	13.58
Actuarial balance:			
25-year: 1988-2012	+2.26	+2.24	+2.21
50-year: 1988-2037	+0.57	+0.53	+0.48
75-year: 1988-2062	-0.54	-0.58	-0.64

For the 25-year period, the cost rate increases with decreasing disability termination rates from 10.52 percent (for the relatively high rates assumed for alternative I) to 10.57 percent (for the relatively low rates assumed for alternative III). For the 50-year period, it increases from 12.31 to 12.39 percent, and for the 75-year period, it increases from 13.47 to 13.58 percent. The actuarial balance decreases from +2.26 to +2.21 percent for the 25-year period, from +0.57 to +0.48 percent for the 50-year period, and from -0.54 to -0.64 percent for the 75-year period.