## H. ASSUMPTIONS AND METHODS UNDERLYING THE ACTUARIAL ESTIMATES

This section 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 three alternatives and for both the short-range and long-range periods. Some of the principal economic and demographic assumptions which vary by alternative are summarized in section II.D. Further details about the assumptions, methods, and actuarial estimates are contained in Actuarial Studies published by the Office of the Actuary, Social Security Administration, which are available upon request.

### 1. Total Population

Projections were made of the population in the Social Security Area by age, sex, and marital status as of January 1 of each year 1990 through 2080. The projections started with an estimate of the United States population, including armed forces overseas, as of January 1, 1989, based on data from the Bureau of the Census. This population estimate was adjusted for net census undercount and increased for other U.S. citizens living abroad and for populations in the geographic areas covered by the OASDI program but not included in the U.S. population. This population was then projected using assumed rates of birth, death, marriage, and divorce and assumed levels of migration.

Historically, fertility rates in the United States 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 children per woman 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 to a level currently estimated at 2.1 for 1990.

These variations in fertility rates have resulted from changes in many factors, including 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 rela-

tively 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, and III, respectively. For each alternative, the total fertility rate is assumed to reach its ultimate level in 2016. 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 2.2 to 1.5, with an intermediate assumption of 1.8.[1] A rate of 2.1 would ultimately result in a nearly constant population if net immigration were zero and if death rates were constant.

Historically, death rates in the United Sates, calculated using final data for 1900-1988, provisional data for 1989, and experience data to obtain estimates for 1990, show a steady declining trend. The age-sex-adjusted death rate—which is calculated here as 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 1990. These reductions in death rates have resulted from many factors, including increased medical knowledge and 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 age, sex, and cause of death were selected for 2016 and later. The intermediate set, which is used for alternative II, is considered to be the one closest to average expectations. Except for those causes of death which primarily affect workers and children, the average annual percentage reductions used for alternative I are smaller than those for alternative II, while those used for alternative III are greater. Between 1990 and 2016, the reductions in central death rates for alternative II are assumed to change gradually from the average annual reductions by age, sex, and cause of death observed between 1968 and 1988, to the ultimate annual percentage reductions by age, sex, and cause of death assumed for 2016 and later. Alternative I reductions are assumed to change gradually from 50 percent of the average annual reductions observed between 1968 and 1988, while alternative III reductions are assumed to change gradually

[1]U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1018, "Projections of the Population of the United States By Age, Sex, and Race: 1988-2080," U.S. Government Printing Office, Washington, D.C., January 1989.

from 150 percent of the average annual reductions observed between 1968 and 1988. The age-sex-adjusted death rate (for all causes combined) declined at an average rate of 1.4 percent per year between 1968 and 1988.

After adjustment for changes in the age-sex distribution of the population, the resulting death rates were projected to decline at an average annual rate of about 0.3 percent, 0.6 percent, and 1.0 percent between 1988 and 2066 for alternatives I, II, and III, respectively.

For calendar years 1989 and 1990, the net legal immigration is assumed to be 470,123 and 492,117 persons per year, respectively. In addition, for these years the net other-than-legal immigration assumption is 200,000 persons per year, which is consistent with the estimates of other-than-legal immigration made by the Bureau of the Census based on the 1980 Census. For calendar year 1991, net immigration is assumed to be 800,000, 600,000, and 450,000 persons per year for alternatives I, II, 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. Because of legislative changes which increase the limits on the number of legal immigrants beginning in 1992, net immigration for the remainder of the projection period is assumed to be 1,000,000, 750,000, and 600,000 persons per year for alternatives I, II, and III, respectively. Of these net numbers of immigrants, 650,000, 550,000, and 500,000, respectively, are assumed to be legal, and the remainders are assumed to be other-than-legal.

Table II.H.1 shows the projected population as of July 1 by broad age group, for the three alternatives. Also shown are tabulated aged dependency ratios (see table footnotes for definitions). 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 II.H.1.—SOCIAL SECURITY AREA POPULATION AS OF JULY 1 AND DEPENDENCY RATIOS, BY ALTERNATIVE AND BROAD AGE GROUP, CALENDAR YEARS 1950-2070

| Calendar year | Population (in thousands) | | | | Dependency ratio | |
|---|---|---|---|---|---|---|
| | Under 20 | 20-64 | 65 and over | Total | Aged[1] | Total[2] |
| Historical data: | | | | | | |
| 1950 ......................... | 53,895 | 92,739 | 12,752 | 159,386 | 0.138 | 0.719 |
| 1960 ......................... | 72,989 | 99,842 | 17,250 | 190,081 | .173 | .904 |
| 1970 ......................... | 80,672 | 113,184 | 20,920 | 214,776 | .185 | .898 |
| 1975 ......................... | 78,428 | 122,852 | 23,265 | 224,545 | .189 | .828 |

**TABLE II.H.1.—SOCIAL SECURITY AREA POPULATION AS OF JULY 1 AND DEPENDENCY RATIOS, BY ALTERNATIVE AND BROAD AGE GROUP, CALENDAR YEARS 1950-2070 (Cont.)**

| | Population (in thousands) | | | | Dependency ratio | |
|---|---|---|---|---|---|---|
| Calendar year | Under 20 | 20-64 | 65 and over | Total | Aged[1] | Total[2] |
| Historical data: (Cont.) | | | | | | |
| 1980 ........................... | 74,544 | 134,429 | 26,148 | 235,121 | 0.195 | 0.749 |
| 1985 ........................... | 73,084 | 144,932 | 29,033 | 247,049 | .200 | .705 |
| 1990[3] ........................ | 74,880 | 152,742 | 31,949 | 259,571 | .209 | .699 |
| Alternative I: | | | | | | |
| 1995 ........................... | 79,053 | 160,431 | 33,987 | 273,472 | .212 | .705 |
| 2000 ........................... | 82,517 | 169,263 | 34,740 | 286,519 | .205 | .693 |
| 2005 ........................... | 84,601 | 178,778 | 35,609 | 298,987 | .199 | .672 |
| 2010 ........................... | 86,429 | 187,076 | 38,155 | 311,660 | .204 | .666 |
| 2015 ........................... | 88,511 | 192,741 | 43,535 | 324,787 | .226 | .685 |
| 2020 ........................... | 91,941 | 195,614 | 50,284 | 337,838 | .257 | .727 |
| 2025 ........................... | 95,622 | 196,691 | 57,765 | 350,078 | .294 | .780 |
| 2030 ........................... | 98,799 | 199,037 | 63,413 | 361,249 | .319 | .815 |
| 2035 ........................... | 101,424 | 204,477 | 65,689 | 371,591 | .321 | .817 |
| 2040 ........................... | 104,063 | 211,602 | 65,908 | 381,573 | .311 | .803 |
| 2045 ........................... | 107,161 | 218,672 | 65,781 | 391,614 | .301 | .791 |
| 2050 ........................... | 110,576 | 224,702 | 66,720 | 401,998 | .297 | .789 |
| 2055 ........................... | 113,945 | 230,322 | 68,661 | 412,928 | .298 | .793 |
| 2060 ........................... | 117,100 | 235,977 | 71,416 | 424,492 | .303 | .799 |
| 2065 ........................... | 120,182 | 242,834 | 73,604 | 436,619 | .303 | .798 |
| 2070 ........................... | 123,403 | 250,151 | 75,550 | 449,104 | .302 | .795 |
| Alternative II: | | | | | | |
| 1995 ........................... | 78,397 | 159,541 | 34,108 | 272,046 | .214 | .705 |
| 2000 ........................... | 80,561 | 167,205 | 35,206 | 282,971 | .211 | .692 |
| 2005 ........................... | 80,763 | 175,591 | 36,534 | 292,888 | .208 | .668 |
| 2010 ........................... | 80,085 | 182,848 | 39,550 | 302,483 | .216 | .654 |
| 2015 ........................... | 79,176 | 187,182 | 45,405 | 311,763 | .243 | .666 |
| 2020 ........................... | 79,473 | 188,132 | 52,660 | 320,265 | .280 | .702 |
| 2025 ........................... | 80,149 | 186,730 | 60,726 | 327,605 | .325 | .754 |
| 2030 ........................... | 80,401 | 186,016 | 67,044 | 333,461 | .360 | .793 |
| 2035 ........................... | 80,197 | 187,750 | 69,960 | 337,908 | .373 | .800 |
| 2040 ........................... | 79,991 | 190,538 | 70,717 | 341,246 | .371 | .791 |
| 2045 ........................... | 79,976 | 192,848 | 71,010 | 343,834 | .368 | .783 |
| 2050 ........................... | 80,181 | 193,575 | 72,239 | 345,996 | .373 | .787 |
| 2055 ........................... | 80,388 | 193,260 | 74,378 | 348,027 | .385 | .801 |
| 2060 ........................... | 80,452 | 192,534 | 77,126 | 350,112 | .401 | .818 |
| 2065 ........................... | 80,421 | 192,897 | 78,947 | 352,265 | .409 | .826 |
| 2070 ........................... | 80,426 | 193,660 | 80,250 | 354,335 | .414 | .830 |
| Alternative III: | | | | | | |
| 1995 ........................... | 77,849 | 159,041 | 34,240 | 271,130 | .215 | .705 |
| 2000 ........................... | 78,838 | 165,880 | 35,678 | 280,396 | .215 | .690 |
| 2005 ........................... | 77,291 | 173,124 | 37,436 | 287,851 | .216 | .663 |
| 2010 ........................... | 74,289 | 179,555 | 40,904 | 294,748 | .228 | .642 |
| 2015 ........................... | 70,698 | 183,043 | 47,249 | 300,989 | .258 | .644 |
| 2020 ........................... | 68,329 | 182,659 | 55,060 | 306,048 | .301 | .676 |
| 2025 ........................... | 66,593 | 179,438 | 63,750 | 309,780 | .355 | .726 |
| 2030 ........................... | 64,647 | 176,299 | 70,860 | 311,806 | .402 | .769 |
| 2035 ........................... | 62,483 | 174,871 | 74,725 | 312,080 | .427 | .785 |
| 2040 ........................... | 60,435 | 173,890 | 76,464 | 310,789 | .440 | .787 |
| 2045 ........................... | 58,470 | 172,097 | 77,678 | 308,244 | .451 | .791 |
| 2050 ........................... | 56,752 | 168,353 | 79,692 | 304,797 | .473 | .810 |
| 2055 ........................... | 55,178 | 163,181 | 82,462 | 300,820 | .505 | .843 |
| 2060 ........................... | 53,624 | 157,459 | 85,522 | 296,605 | .543 | .884 |
| 2065 ........................... | 52,071 | 153,026 | 87,180 | 292,278 | .570 | .910 |
| 2070 ........................... | 50,584 | 149,221 | 87,963 | 287,768 | .589 | .928 |

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

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

[3]Estimated

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

## 2. 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 (1) State and local government employment that will result from the Omnibus Budget Reconciliation Act of 1990 and (2) Federal civilian employment that will result from the 1983 Social Security Amendments.

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 2070 for alternatives I, II, and III are 1.0, 1.5, and 1.7 percentage points lower, respectively, than the 1991 level of 76.1 percent. For women, the projected age-adjusted labor force participation rates increase for alternatives I and II and decrease for alternative III. The projected rates for 2070 are 2.0, 0.8, and -1.0 percentage points, respectively, different from the 1991 level of 57.4 percent.

The total age-sex-adjusted unemployment rate averaged 5.7 percent for the last 30 years 1962-91 and 6.7 percent for the last 10 years 1982-91. The ultimate total age-sex-adjusted unemployment rate is assumed to be about 5, 6, and 7 percent for alternatives I, II, and III, respectively. Because the unemployment rate depends on the state of the economy, cyclical trends are reflected in the short-range period. Unemployment levels off to the assumed ultimate age-sex-adjusted rate by the year 2002, for each of the three alternatives.

The projected age-adjusted coverage rate for men decreases from its 1991 level of 73.8 percent to 73.2, 72.4, and 71.8 percent in 2070 on the basis of alternatives I, II, and III, respectively. For women, it changes from its 1991 level of 58.4 percent to 60.4, 58.9, and 57.1 percent for alternatives I, II, and III, respectively.

### 3. Average Earnings, Inflation, and Real Interest Rate

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. Increases in the CPI directly affect the automatic cost-of-living benefit increases, while inflation, in general, affects the nominal levels of average earnings, GDP, and taxable payroll. 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. 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 for OASDI covered employment in table II.D.1 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 1961-90, annual increases in productivity for the total U.S. economy averaged 1.5 percent, the result of average annual increases of 2.4, 1.3, and 0.9 percent for the 10-year periods 1961-70, 1971-80 and 1981-90, respectively. Meanwhile, the average annual rate of change in average real earnings was an increase of 0.8 percent for the 30 years 1961-90, the result of average annual increases of 2.2, -0.7, and 0.8 percent, respectively, for the aforementioned 10-year periods. The change in the linkage between annual increases in productivity and real earnings averaged 0.7 percent for the 30 years 1961-90, and 0.2, 2.0, and 0.1 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, the proportion of employee compensation paid as wages,

**152**

and price adjustment due to the ratio of the GDP price deflator index to the CPI.

The ultimate annual increases in productivity for all sectors—wage-and-salary workers, self-employed persons, and the total economy—are assumed to be 1.9, 1.5, and 1.2 percent for alternatives I, II, and III, respectively. The corresponding ultimate annual rates of change in the linkage for wage-and-salary workers are assumed to be declines of 0.2, 0.4, and 0.6 percent for alternatives I, II, and III, respectively. This linkage is made up of assumed annual decreases of 0.1, 0.2, and 0.3 percent in average hours worked per year, and 0.1, 0.2, and 0.3 percent annual declines in wages as a share of compensation, for alternatives I, II, and III, respectively. No ultimate change is assumed for the historically relatively stable ratio of employee compensation to GDP. The resulting ultimate real-wage differentials are 1.7, 1.1, and 0.6 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.

Historically, the CPI has increased, on average, by 4.2 percent for the last 40 years 1952-91, 5.1 percent for the last 30 years 1962-91, 6.2 percent for the last 20 years 1972-91, and 3.9 percent for the last 10 years 1982-91. The 6.2 percent increase during 1972-91 reflects sharp increases in oil prices and their subsequent effect on the overall economy. The ultimate average annual CPI increases of 3.0, 4.0, and 5.0 percent for alternatives I, II, III, respectively, were chosen to include a reasonable range of possible future experiences. Ultimate annual increases in the GDP 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 4.7, 5.1, and 5.6 percent, for alternatives I, II, and III, respectively. These were obtained, for each alternative, by adding the assumed annual percentage increase in the CPI to the assumed 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.

The interest rate considered in this report is the nominal interest rate, which is compounded semiannually, for special U.S. government obligations issuable to the trust funds in each of 12 months of the year. The real interest rate is defined to be the annual (compounded) yield rate for investments in these securities less growth in the CPI-W.

In developing a reasonable range of assumed future real interest rates for the three alternatives, historical experience was examined for the last 40 years, 1951-1990, and for each of the 10-year subperiods, 1951-1960, 1961-1970, 1971-1980, and 1981-1990. For the 40-year period, the real interest rate averaged 1.9 percent per year. For the four 10-year subperiods, the real interest rates averaged 0.3, 1.7, -0.4, and 6.0 percent per year, respectively. The assumed ultimate real interest rates are 3.0 percent, 2.3 percent, and 1.5 percent for alternatives I, II, and III, respectively. Rates are assumed to trend toward these ultimate values from recent high levels during the next 10 years.

## 4. Taxable Payroll and Taxes

The taxable payroll for any period 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 for work during the period. 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 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.

For the 1992 report, a larger than expected decrease in the estimated ratio of taxable earnings to earnings in OASDI covered employment for 1990, along with the assumption that this ratio will decline slightly over the next decade, result in a decrease in the projected level of taxable payroll as compared with estimates in the 1991 report.

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.

## 5. Insured Population

There are three basic types of insured status under the OASDI program: fully insured, currently insured, and disability insured. Fully insured status is required of an aged worker for eligibility to a primary retirement benefit and for the eligibility of that 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, from estimated distributions of workers by accumulated quarters of coverage based on past and projected coverage rates and amounts of earnings required for quarters of coverage. 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 76.4 on January 1, 1991, to 90.3, 90.2, and 90.0 on January 1, 2066, based on alternatives I, II, and III, respectively. The increase for females is projected to be much greater than the increase for males. Based on alternative II, for example, the percentage for males is projected to increase only slightly during this period from 91.9 to 92.4, while that for females is projected to increase more substantially from 65.2 to 88.5.

The fully insured population by age and sex was further subdivided by marital status, 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.

## 6. 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.

For the short-range period, the numbers of retired-worker beneficiaries were developed by applying award rates to the aged fully insured population less those persons entitled to retired-worker or widow(er)'s benefits, and by applying termination rates to the numbers of persons already receiving retired-worker benefits. For the long range, the numbers of retired-worker beneficiaries who were not previously converted from disabled-worker beneficiary status were projected as a percentage of the "exposed population," i.e., the aged fully insured population less those persons entitled to or converted from disability benefits and those insured persons entitled to widow(er)'s benefits. The percentages for ages 70 and over were assumed to be nearly 100, because the retirement earnings test and delayed retirement credit do not apply after age 70. The percentages for ages 62 through 69 were adjusted in accordance with observed historical and projected short-range trends, and, for each year of attainment of age 62, 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 adjustments is to decrease the percentages to ultimate values, which are 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

**157**

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 each age 50 through 64 as a percentage of the widowed and divorced populations, adjusted for the insured status of the deceased spouse and the prevalence of disability.

The projected numbers of children under age 18, and students aged 18, who are eligible for benefits as survivors of deceased workers, were based on the projected numbers of children in the population whose mothers or fathers are deceased. In the short-range period, a regression equation was used to project the number of minor-child-survivor beneficiaries as a percentage of such orphaned children. In the long-range period, the numbers of child-survivor beneficiaries were projected in a manner analogous to that for child beneficiaries of retired workers, with the factor representing the probability that the parent is aged 62 or over being replaced by a factor that represented the probability that the parent is deceased.

In the short-range period, the numbers of mother-survivor and father-survivor beneficiaries were projected from the numbers of child-survivor beneficiaries who are either under age 16 or disabled. In the long-range period, mother-survivor and father-survivor beneficiaries were estimated from the numbers of child-survivor beneficiaries, taking into account projected changes in average family size.

The numbers of parent-survivor beneficiaries were projected based on the historical pattern of the numbers of such beneficiaries.

Table II.H.2 shows the projected numbers of beneficiaries under the OASI program. Included among the beneficiaries who receive retired-worker benefits are some persons who also receive a residual benefit consisting of the excess of an auxiliary benefit over their retired-worker benefit. Estimates of the numbers of such residual payments were made separately for spouses and widow(er)s.

**TABLE II.H.2.—OASI BENEFICIARIES WITH MONTHLY BENEFITS IN CURRENT-PAYMENT STATUS AS OF DECEMBER 31 BY ALTERNATIVE, CALENDAR YEARS 1945-2070**

[In thousands]

| Calendar year | Retired workers and auxiliaries | | | Survivors | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Worker | Wife-husband | Child | Widow-widower | Mother-father | Child | Parent | |
| Historical data: | | | | | | | | |
| 1945 ...... | 518 | 159 | 13 | 94 | 121 | 377 | 6 | 1,288 |
| 1950 ...... | 1,771 | 508 | 46 | 314 | 169 | 653 | 15 | 3,477 |
| 1955 ...... | 4,474 | 1,192 | 122 | 701 | 292 | 1,154 | 25 | 7,961 |
| 1960 ...... | 8,061 | 2,269 | 268 | 1,544 | 401 | 1,577 | 36 | 14,157 |
| 1965 ...... | 11,101 | 2,614 | 461 | 2,371 | 472 | 2,074 | 35 | 19,128 |
| 1970 ...... | 13,349 | 2,668 | 546 | 3,227 | 523 | 2,688 | 29 | 23,030 |
| 1975 ...... | 16,588 | 2,867 | 643 | 3,889 | 582 | 2,919 | 21 | 27,509 |
| 1980 ...... | 19,562 | 3,016 | 639 | 4,411 | 562 | 2,610 | 15 | 30,814 |
| 1985 ...... | 22,432 | 3,069 | 457 | 4,863 | 372 | 1,917 | 10 | 33,120 |
| 1986 ...... | 22,987 | 3,088 | 450 | 4,931 | 350 | 1,875 | 9 | 33,690 |
| 1987 ...... | 23,440 | 3,090 | 440 | 4,984 | 329 | 1,836 | 8 | 34,126 |
| 1988 ...... | 23,858 | 3,086 | 432 | 5,029 | 318 | 1,810 | 7 | 34,539 |
| 1989 ...... | 24,327 | 3,093 | 423 | 5,071 | 312 | 1,780 | 6 | 35,012 |
| 1990 ...... | 24,838 | 3,101 | 422 | 5,111 | 304 | 1,776 | 6 | 35,559 |
| 1991 ...... | 25,289 | 3,104 | 426 | 5,158 | 301 | 1,791 | 5 | 36,074 |
| Alternative I: | | | | | | | | |
| 1995 ...... | 26,388 | 3,116 | 454 | 5,390 | 299 | 1,827 | 4 | 37,477 |
| 2000 ...... | 27,203 | 3,079 | 496 | 5,564 | 299 | 1,912 | 3 | 38,556 |
| 2005 ...... | 28,745 | 2,876 | 559 | 5,671 | 280 | 2,007 | 3 | 40,142 |
| 2010 ...... | 31,978 | 2,632 | 620 | 5,824 | 268 | 2,021 | 3 | 43,346 |
| 2015 ...... | 37,570 | 2,435 | 695 | 5,959 | 253 | 2,025 | 3 | 48,941 |
| 2020 ...... | 44,318 | 2,333 | 766 | 6,087 | 244 | 2,052 | 3 | 55,803 |
| 2025 ...... | 50,347 | 2,295 | 818 | 6,210 | 247 | 2,107 | 3 | 62,027 |
| 2030 ...... | 54,626 | 2,226 | 859 | 6,242 | 252 | 2,168 | 3 | 66,377 |
| 2035 ...... | 56,836 | 2,151 | 895 | 6,190 | 256 | 2,219 | 3 | 68,549 |
| 2040 ...... | 57,216 | 2,063 | 916 | 6,095 | 259 | 2,257 | 3 | 68,809 |
| 2045 ...... | 57,471 | 2,032 | 942 | 6,019 | 262 | 2,294 | 3 | 69,022 |
| 2050 ...... | 58,438 | 2,054 | 972 | 5,964 | 266 | 2,337 | 3 | 70,033 |
| 2055 ...... | 60,371 | 2,133 | 1,017 | 5,960 | 271 | 2,383 | 3 | 72,137 |
| 2060 ...... | 62,596 | 2,212 | 1,057 | 5,998 | 276 | 2,430 | 3 | 74,572 |
| 2065 ...... | 64,535 | 2,271 | 1,089 | 6,080 | 281 | 2,473 | 3 | 76,731 |
| 2070 ...... | 66,346 | 2,322 | 1,117 | 6,210 | 285 | 2,516 | 3 | 78,799 |
| Alternative II: | | | | | | | | |
| 1995 ...... | 26,490 | 3,116 | 452 | 5,397 | 306 | 1,874 | 4 | 37,641 |
| 2000 ...... | 27,581 | 3,092 | 491 | 5,604 | 308 | 1,958 | 3 | 39,037 |
| 2005 ...... | 29,424 | 2,986 | 556 | 5,692 | 294 | 1,964 | 3 | 40,919 |
| 2010 ...... | 32,988 | 2,788 | 611 | 5,841 | 275 | 1,882 | 3 | 44,387 |
| 2015 ...... | 38,941 | 2,634 | 675 | 5,975 | 260 | 1,799 | 3 | 50,287 |
| 2020 ...... | 46,103 | 2,561 | 731 | 6,101 | 255 | 1,755 | 3 | 57,508 |
| 2025 ...... | 52,585 | 2,550 | 764 | 6,225 | 256 | 1,744 | 3 | 64,128 |
| 2030 ...... | 57,442 | 2,506 | 786 | 6,273 | 256 | 1,742 | 3 | 69,009 |
| 2035 ...... | 60,231 | 2,443 | 803 | 6,263 | 252 | 1,739 | 3 | 71,734 |
| 2040 ...... | 61,122 | 2,355 | 803 | 6,229 | 246 | 1,724 | 3 | 72,483 |
| 2045 ...... | 61,728 | 2,327 | 805 | 6,214 | 241 | 1,704 | 3 | 73,021 |
| 2050 ...... | 62,933 | 2,360 | 811 | 6,204 | 237 | 1,686 | 3 | 74,233 |
| 2055 ...... | 64,977 | 2,466 | 830 | 6,206 | 234 | 1,668 | 3 | 76,384 |
| 2060 ...... | 67,114 | 2,569 | 846 | 6,204 | 230 | 1,650 | 3 | 78,616 |
| 2065 ...... | 68,690 | 2,634 | 853 | 6,218 | 226 | 1,631 | 3 | 80,254 |
| 2070 ...... | 69,879 | 2,670 | 855 | 6,269 | 222 | 1,611 | 3 | 81,509 |

**TABLE II.H.2.—OASI BENEFICIARIES WITH MONTHLY BENEFITS IN CURRENT-PAYMENT STATUS AS OF DECEMBER 31 BY ALTERNATIVE, CALENDAR YEARS 1945-2070(Cont.)**

[In thousands]

| Calendar year | Retired workers and auxiliaries | | | Survivors | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Worker | Wife-husband | Child | Widow-widower | Mother-father | Child | Parent | |
| Alternative III: | | | | | | | | |
| 1995 ...... | 26,603 | 3,120 | 451 | 5,409 | 301 | 1,834 | 4 | 37,722 |
| 2000 ...... | 27,959 | 3,114 | 488 | 5,654 | 304 | 1,938 | 3 | 39,459 |
| 2005 ...... | 30,044 | 3,098 | 551 | 5,726 | 331 | 2,008 | 3 | 41,760 |
| 2010 ...... | 33,885 | 2,946 | 597 | 5,879 | 300 | 1,839 | 3 | 45,450 |
| 2015 ...... | 40,193 | 2,839 | 652 | 6,012 | 264 | 1,630 | 3 | 51,593 |
| 2020 ...... | 47,785 | 2,805 | 693 | 6,133 | 243 | 1,486 | 3 | 59,149 |
| 2025 ...... | 54,724 | 2,829 | 708 | 6,250 | 235 | 1,418 | 3 | 66,167 |
| 2030 ...... | 60,311 | 2,828 | 710 | 6,290 | 228 | 1,382 | 3 | 71,753 |
| 2035 ...... | 63,987 | 2,807 | 710 | 6,294 | 220 | 1,356 | 3 | 75,377 |
| 2040 ...... | 65,802 | 2,756 | 692 | 6,299 | 209 | 1,320 | 3 | 77,080 |
| 2045 ...... | 67,167 | 2,768 | 674 | 6,333 | 197 | 1,274 | 3 | 78,415 |
| 2050 ...... | 69,018 | 2,847 | 659 | 6,355 | 186 | 1,227 | 3 | 80,296 |
| 2055 ...... | 71,513 | 3,013 | 660 | 6,349 | 177 | 1,181 | 3 | 82,896 |
| 2060 ...... | 73,861 | 3,165 | 657 | 6,288 | 168 | 1,136 | 3 | 85,278 |
| 2065 ...... | 75,284 | 3,249 | 648 | 6,218 | 159 | 1,091 | 3 | 86,652 |
| 2070 ...... | 75,991 | 3,275 | 635 | 6,179 | 150 | 1,047 | 3 | 87,280 |

Note: The numbers of beneficiaries do not include certain uninsured persons, most of whom both attained age 72 before 1968 and have fewer than 3 quarters of coverage, in which cases the costs are reimbursed by the general fund of the Treasury. The number of such uninsured persons was 5,299 as of December 31, 1991, and is estimated to be fewer than 500 by the turn of the century. Totals do not necessarily equal the sums of rounded components.

## 7. Disability Insurance Beneficiaries

The numbers of DI beneficiaries were projected for each type of benefit separately, by the sex of the worker on whose earnings the benefits are based, and the age of the beneficiary. The numbers of disabled-worker beneficiaries were projected from the estimated numbers of such beneficiaries entitled on December 31, 1990, 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, 1990. The numbers of new entitlements during each year were projected by applying assumed disability incidence rates. 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, the numbers of terminations were projected by applying assumed

termination rates (for death and recovery combined), by age and sex, to the entitled disabled-worker population. In the long-range period, the numbers of terminations were projected by applying assumed death rates and recovery rates, by age, sex, and duration of entitlement, to the entitled disabled-worker population. The numbers of terminations were then increased, in both the short-range and long-range periods, by the numbers of disabled-worker beneficiaries who would be automatically converted to retired-worker beneficiaries at the normal retirement age (currently, age 65).

Disability incidence rates declined rapidly from historically high levels for 1974-75 to a level less than half as large by the year 1982. From 1982 through 1985, incidence rates increased steadily, regaining about one-fifth of the decline from the prior period. Between 1986 and 1989, incidence rates remained fairly steady. From 1989 to 1991, incidence rates again increased at a rapid pace, reaching a level about midway between the high rates of 1974-75 and the low rates for 1982.

Assumed future levels for disability incidence rates are determined in two stages: (1) rates are first projected from recent levels based on past trends and future expectations, as if the increases scheduled in present law for the normal retirement age (NRA) would not occur, and (2) rates for the year 2000 and later are then adjusted to reflect the scheduled increase in the NRA, which tends to increase incidence rates for persons aged 60 through 64 established in the first stage as well as establishing incidence rates up to the scheduled NRA (ultimately 67).

For the intermediate alternative II assumptions, the incidence rates are projected to continue increasing through 2000. Rates projected under the first stage increase from 1991 levels by about 10 percent through the year 2000, reaching a level of about 5.3 per thousand persons exposed (defined as the number of persons who are disability insured but are not currently entitled to disabled worker benefits), age-sex-adjusted to the 1980 exposed population. By the year 2005, the age-sex-adjusted incidence rate is assumed to reach the ultimate first-stage assumed level of 5.1 per thousand exposed.

Further increases in incidence rates over age 60 along with rates assumed for persons aged 66 and 67, due to the scheduled increase in the NRA are reflected in the second stage. These adjustments contribute to the overall rise in the gross disability incidence rate from a level of 4.9 per thousand exposed for 1991 to an ultimate rate of 6.9 per thousand

exposed by the year 2026, at which time the scheduled increase in the NRA will be complete.

For the other alternatives, the disability incidence rates are assumed to follow patterns through time similar to the one for alternative II. For alternative I, the stage-one level of the age-sex-adjusted disability incidence rate for the year 2005 is assumed to be roughly 10 percent lower than that estimated for 1991. The 2026 total gross incidence rate is assumed to be 5.8 per thousand exposed. For alternative III, the stage-one level of the age-sex adjusted rate for 2005 is assumed to be roughly 30 percent higher than the estimated 1991 level. This ultimate stage-one level for alternative III is about 10 percent below the peak incidence rates experienced for 1974-75. The ultimate stage-two gross incidence rate under alternative III is assumed to reach about 9 per thousand exposed by 2026.

In the short-range period, the termination rates were projected by age and sex. For alternative II, the rates were projected to increase from the relatively low levels of 1986-91, by about 15 percent. 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 rates 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 alternative II, they reach levels in 2070 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 1990 levels until 2000, when they attain ultimate levels about 5 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, 1984, and 1990.

For alternative I, the death rates in 2070 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 25 percent higher than those of the same period. For alternative III, the death rates in 2070 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 15 percent lower than 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 II.H.3 shows the projected numbers of beneficiaries under the DI program.

## TABLE II.H.3.—DI BENEFICIARIES WITH MONTHLY BENEFITS IN CURRENT-PAYMENT STATUS AS OF DECEMBER 31 BY ALTERNATIVE, CALENDAR YEARS 1960-2070

[In thousands]

| Calendar year | Disabled worker | Auxiliaries | | Total |
|---|---|---|---|---|
| | | Wife-husband | Child | |
| **Historical data:** | | | | |
| 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 | 2,786 | 291 | 968 | 4,045 |
| 1988 | 2,830 | 281 | 963 | 4,074 |
| 1989 | 2,895 | 271 | 962 | 4,129 |
| 1990 | 3,011 | 266 | 989 | 4,266 |
| 1991 | 3,195 | 266 | 1,052 | 4,513 |
| **Alternative I:** | | | | |
| 1995 | 3,642 | 260 | 1,154 | 5,056 |
| 2000 | 4,242 | 266 | 1,248 | 5,756 |
| 2005 | 4,679 | 284 | 1,283 | 6,246 |
| 2010 | 5,449 | 285 | 1,293 | 7,027 |
| 2015 | 5,882 | 268 | 1,288 | 7,439 |
| 2020 | 6,085 | 261 | 1,308 | 7,654 |
| 2025 | 6,374 | 277 | 1,361 | 8,012 |
| 2030 | 6,366 | 276 | 1,421 | 8,062 |
| 2035 | 6,362 | 275 | 1,472 | 8,109 |
| 2040 | 6,501 | 275 | 1,515 | 8,292 |
| 2045 | 6,882 | 288 | 1,562 | 8,732 |
| 2050 | 7,162 | 299 | 1,613 | 9,074 |
| 2055 | 7,419 | 313 | 1,672 | 9,404 |
| 2060 | 7,544 | 320 | 1,730 | 9,595 |
| 2065 | 7,738 | 327 | 1,785 | 9,851 |
| 2070 | 8,020 | 336 | 1,838 | 10,194 |
| **Alternative II:** | | | | |
| 1995 | 3,906 | 280 | 1,234 | 5,420 |
| 2000 | 4,904 | 306 | 1,421 | 6,632 |
| 2005 | 5,641 | 366 | 1,550 | 7,557 |
| 2010 | 6,577 | 380 | 1,537 | 8,493 |
| 2015 | 7,082 | 374 | 1,488 | 8,944 |
| 2020 | 7,288 | 377 | 1,462 | 9,126 |
| 2025 | 7,584 | 404 | 1,473 | 9,461 |
| 2030 | 7,526 | 405 | 1,496 | 9,427 |
| 2035 | 7,478 | 402 | 1,519 | 9,398 |
| 2040 | 7,599 | 398 | 1,530 | 9,527 |
| 2045 | 7,992 | 412 | 1,538 | 9,942 |
| 2050 | 8,226 | 422 | 1,547 | 10,194 |
| 2055 | 8,376 | 436 | 1,561 | 10,373 |
| 2060 | 8,300 | 436 | 1,573 | 10,309 |
| 2065 | 8,293 | 434 | 1,584 | 10,311 |
| 2070 | 8,377 | 436 | 1,590 | 10,403 |
| **Alternative III:** | | | | |
| 1995 | 4,152 | 298 | 1,306 | 5,756 |
| 2000 | 5,698 | 358 | 1,634 | 7,691 |
| 2005 | 7,072 | 504 | 1,960 | 9,537 |
| 2010 | 8,375 | 555 | 1,945 | 10,875 |
| 2015 | 9,089 | 572 | 1,850 | 11,511 |
| 2020 | 9,395 | 589 | 1,770 | 11,753 |
| 2025 | 9,791 | 629 | 1,731 | 12,151 |
| 2030 | 9,721 | 629 | 1,709 | 12,059 |
| 2035 | 9,648 | 619 | 1,697 | 11,964 |
| 2040 | 9,760 | 606 | 1,670 | 12,036 |
| 2045 | 10,183 | 617 | 1,631 | 12,431 |
| 2050 | 10,335 | 620 | 1,591 | 12,546 |
| 2055 | 10,308 | 629 | 1,557 | 12,494 |

**165**

**TABLE II.H.3.—DI BENEFICIARIES WITH MONTHLY BENEFITS IN CURRENT-PAYMENT STATUS AS OF DECEMBER 31 BY ALTERNATIVE, CALENDAR YEARS 1960-2070 (Cont.)**

[In thousands]

| Calendar year | Disabled worker | Auxiliaries | | Total |
| | | Wife-husband | Child | |
|---|---|---|---|---|
| Alternative III: (Cont.) | | | | |
| 2060 ................................................ | 9,904 | 610 | 1,524 | 12,038 |
| 2065 ................................................ | 9,594 | 590 | 1,491 | 11,675 |
| 2070 ................................................ | 9,401 | 576 | 1,456 | 11,432 |

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

## 8. 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 1988.

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.

## 9. 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 (unindexed in future years).

## 10. Administrative Expenses

The projection of administrative expenses through 2001 was based on assumed increases in average wages, increases in the CPI, and increases in the number of beneficiaries. For years after 2001, administrative expenses are assumed to increase because of increases in the numbers of beneficiaries and increases in average wages which will more than offset assumed improvements in administrative productivity.

## 11. Railroad Retirement Financial Interchange

Railroad workers are covered under a separate multi-tiered plan, the first tier being very similar to OASDI coverage. An annual financial interchange between the Railroad Retirement fund and the OASI and DI funds is made reflecting the difference between the amount of OASDI benefits that would be paid to railroad workers and their families if railroad employment had been covered under the OASDI program and the amount of OASDI payroll tax that would be received from railroad workers if they were covered directly under the OASDI program.

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 $3-5 billion and a long-range summarized cost of 0.03 percent of taxable payroll to the OASDI program.

## 12. 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 2000. 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.

### 13. 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 1990, and additional adjustments will be made in 1995 and every fifth year thereafter. The adjustments for 1995 were estimated based on the change in interest rates since the determination of the adjustments in 1990. No adjustments after 1995 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.

### 14. 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.