

Combining a benefit formula change with an increase in the age of retirement would result in total benefit reductions that were slightly less than the sum of the reductions under each option, but that were still very large. For a 65-year-old minimum wage earner, for example, the combination of the reduced-bend-point proposal and the raised-retirement-age proposal would result in a benefit cut of about 24 percent relative to current law. For a minimum wage earner who retired at age 68, the combined reduction would still be about 13 percent. Reductions for an average wage worker would be about 21 percent at 65 and about 11 percent at 68, and for a maximum wage earner about the same as for a minimum wage earner. If the proportional-benefit-reduction proposal was substituted for the reduced-bend-point proposal, total reductions would also be about 24 percent at age 65 and 15 percent at age 68.

Payroll Tax Increases

A series of increases in payroll tax rates would constitute one of the few options that could by itself solve the entire projected financing problem. The increases could be phased in as the costs of the system rose. Under the Alternative II-B assumptions, this would require a tax increase from about 12.4 percent to about 14.4 percent in 2020 and further increases after that, to an ultimate rate of about 17 percent.

Solving the trust fund problem in this way would allow revenue increases to be tailored to the projected needs of the trust funds, and would eliminate the need for large-scale benefit reductions relative to current law. If future incomes increased as much as projected, future workers would be relatively well-off compared with the workers and beneficiaries of today, and payroll tax increases of the magnitude that would be needed under the Alternative II-B projections might not impose excessive burdens. Under this option, for example, payroll tax revenues in 2030 would be about one percent more of GNP than in 1985.

On the other hand, delaying action until after 2020 would entail the risk of higher tax increases than if the economy did not perform as well as projected. Under the Alternative III assumptions, for example, a tax rate of about 18 percent in 2020 and an ultimate rate of about 28 percent would be required. In addition, payroll tax increases, even of the magnitude needed under the Alternative II-B assumptions, could have substantial effects on work incentives and on productivity. Since the payroll tax is slightly regressive because of the cap on taxable earnings, and because it only affects earned income, such increases would lessen the overall progressivity of the tax system. They would also reduce rates of return for future workers, while providing no additional margin of safety for the trust funds in the meantime.

Combination of Benefit Reductions and Tax Increases

A combination of benefit reductions and tax increases could achieve a similar total impact on long-run trust fund balances, without as large an impact on either benefit adequacy or future wages. Such a combination could also be designed so that the impact of the changes on those affected would be smaller, at least at any single time. A combination of tax increases and benefit cuts might reduce total lifetime incomes for current workers as much as a large payroll tax increase or a combination of future benefit reductions, by affecting the same people both as workers and as recipients, but since not all of the reductions would take place at one time they might prove less disruptive.

This type of combination could also be used to maintain long-run solvency without building up much larger reserves than under current law in the early 21st century--for example, if a formula change or increase in the age of retirement was combined with a tax increase occurring after 2020. If, on the other hand, an additional margin of safety for the near term was also desired, any of these longer-run options could be combined with benefit reductions or tax increases affecting current beneficiaries, such as temporary reductions in cost-of-living adjustments or the taxation of Social Security benefits. This would have the advantage of avoiding larger decreases in rates of return for future beneficiaries, by reducing the future payroll tax increases or benefit cuts that would be needed. Except to the extent that workers changed their behavior in response to tax increases, the options included in this type of combination generally would not reinforce or offset each other, so the total impact would be approximately equal to the sum of the effects of the individual options, as shown in Table 11.²

2. Savings estimates for specific combinations of options are not generally available.

APPENDIXES

APPENDIX A. EXAMPLE BENEFIT COMPUTATIONS

This appendix presents the benefit computations for hypothetical workers at different earnings levels who are age 62 in 1982. It includes computations both under the procedure enacted in the 1977 amendments and under the transitional guarantee provided within those amendments. The reader should bear in mind that the hypothetical workers are not typical; full-time steady earnings growing at the rates shown in Table A-1 are highly unlikely. The earnings records of actual workers have much greater variability, making determination of the earnings history of the average actual retiree more difficult than in those examples.

Table A-1 contains the earnings histories of three different steady workers: one with annual wages equal to full-time work at the federal minimum wage, one with earnings equal to the economywide average, and one who always earned the Social Security maximum taxable wage. Only earnings after 1950 are considered for use in the computation of benefits under the procedure contained in the 1977 legislation.¹

Benefit Computation Rules

The 1977 law calls for wages to be indexed to the wage levels prevailing in the year a worker reaches age 60. For a worker turning 62 in 1982, the indexing year is 1980; earnings in 1980 averaged \$12,513. Earnings in all years before 1980 are indexed by the ratio of average economywide earnings in 1980 to the average in each of the corresponding years. For example, workers' covered earnings in 1960 are multiplied by \$12,513 divided by \$4,007, or 3.123. If a worker had earned \$3,000 in employment covered by Social Security in 1960, the indexed value would be \$9,369. Annual earnings after age 60 are not indexed, but rather are included at their nominal levels.

In order to become eligible for a retired worker's benefit, a retiree must be fully insured for retirement benefits. To be fully insured, a worker must have quarters of Social Security coverage equal to the number of years after 1950 or age 21, whichever is later, and before the year in which age 62

1. In practice, benefits may be computed using pre-1951 earnings, but this method, known as the "old-start" method, rarely results in higher benefits.

TABLE A-1. EARNINGS HISTORIES FOR HYPOTHETICAL WORKERS AGE 62 IN 1982
(Rounded to the nearest dollar)

Year	Nominal Earnings			Indexing Factor	Indexed Earnings		
	Minimum ^a	Average ^b	Maximum ^c		Minimum	Average	Maximum
1951	1,560	2,799	3,600	4.470	6,974	12,513 ^d	16,094
1952	1,560	2,973	3,600	4.209	6,565	12,513 ^d	15,151
1953	1,560	3,139	3,600	3.986	6,218	12,513 ^d	14,349
1954	1,560	3,156	3,600	3.965	6,186	12,513 ^d	14,276 ^d
1955	1,560	3,301	4,200	3.790	5,913 ^d	12,513 ^d	15,919
1956	1,993	3,532	4,200	3.543	7,060	12,513	14,879
1957	2,080	3,642	4,200	3.436	7,147	12,513	14,432
1958	2,080	3,674	4,200	3.406	7,085	12,513	14,306
1959	2,080	3,856	4,800	3.245	6,750	12,513	15,578
1960	2,080	4,007	4,800	3.123	6,495	12,513	14,989
1961	2,184	4,087	4,800	3.062	6,687	12,513	14,697
1962	2,392	4,291	4,800	2.916	6,975	12,513	13,997 ^d
1963	2,461	4,397	4,800	2.846	7,004	12,513	13,661 ^d
1964	2,600	4,576	4,800	2.734	7,109	12,513	13,125 ^d
1965	2,600	4,659	4,800	2.686	6,984	12,513	12,893 ^d
1966	2,600	4,938	6,600	2.534	6,588	12,513	16,724
1967	2,886	5,213	6,600	2.400	6,927	12,513	15,842
1968	3,293	5,572	7,800	2.246	7,396	12,513	17,518
1969	3,328	5,894	7,800	2.123	7,066	12,513	16,561
1970	3,328	6,186	7,800	2.023	6,732	12,513	15,778
1971	3,328	6,497	7,800	1.926	6,410	12,513	15,023
1972	3,328	7,134	9,000	1.754	5,838 ^d	12,513	15,787
1973	3,328	7,580	10,800	1.651	5,494 ^d	12,513	17,829
1974	3,883	8,031	13,200	1.558	6,050 ^d	12,513	20,568
1975	4,368	8,631	14,100	1.450	6,333	12,513	20,443
1976	4,784	9,226	15,300	1.356	6,488	12,513	20,751
1977	4,784	9,779	16,500	1.280	6,121 ^d	12,513	21,113
1978	5,512	10,556	17,700	1.185	6,534	12,513	20,982
1979	6,032	11,479	22,900	1.090	6,575	12,513	24,963
1980	6,448	12,513	25,900	1.000	6,448	12,513	25,900
1981	6,968	13,595	29,700	1.000	6,968	13,595	29,700

- a. Full-time worker at the federal minimum wage.
- b. Full-time worker with earnings equal to the average in the economy.
- c. Worker earning the Social Security taxable maximum wage.
- d. Dropout years.

is reached. Therefore, for a worker turning 62 in 1982, 31 quarters of Social Security coverage are required. For those attaining 62 in 1991 or later, 40 quarters of coverage will be required in order to be fully insured.

Before 1978, a worker earned one quarter of coverage for each calendar quarter in which at least \$50 of wages was received. Beginning in 1978, each \$250 of annual earnings results in one quarter of coverage up to a maximum of four quarters annually. This earnings requirement is automatically increased each year to reflect the growth in overall wage levels.

The number of years of covered earnings that must be included in the benefit computation is five less than the required number of quarters of coverage. These five years are generally referred to as dropout years. The worker age 62 in 1982, therefore, will have benefits based on the highest 26 years of earnings, and by 1991, benefits for workers age 62 will be based on 35 years of earnings.

AIME Computation Method. To compute benefits for workers age 62 in 1982 under the new procedure enacted in 1977, indexed earnings in the highest 26 years must be totaled. A lifelong full-time worker earning the minimum wage, for example, would therefore be able to drop earnings in 1955, 1972, 1973, 1974, and 1977, and would have total indexed earnings of \$175,706 (see Table A-1). Dividing this by the number of months in the computation period (26 years x 12 months = 312 months) results in an average indexed monthly earnings (AIME) of \$563. The corresponding AIMEs for the average and maximum earners are \$1,046 and \$1,493.

Earnings after age 62 can increase the AIME if these later earnings exceed the indexed earnings in some previous year. Again, in the example of the minimum-wage worker, full-time earnings in 1982 would amount to \$6,968, which is higher than earnings in many years included in computing the AIME. Therefore, the 1982 earnings of \$6,968 could be used to replace the lowest of the 26 included years (\$6,186 in 1954) used to calculate the AIME. The substitution increases this worker's AIME by \$2.51. Although for this example worker the effect of this recomputation is less than a 1 percent increase in AIME, the effect on actual workers is likely to be much greater. For instance, if the worker had only 25 years of earnings in the 1951-1981 period, the 1982 earnings of \$6,968 would have replaced a year of \$0 earnings in the computation. In that case, the AIME would increase by \$22.33 with the recomputation.

Once the AIME has been calculated, it is transformed into the worker's basic benefit or primary insurance amount (PIA) according to a specific formula. For a worker reaching age 62 in 1982, the PIA equals 90 percent of the first \$230 of AIME, 32 percent of the next \$1,158, and 15 percent of the

AIME above \$1,388. Applying this formula to the AIMEs of the three example workers results in PIAs of \$314 for the minimum-wage worker, \$468 for the average-wage worker, and \$593 for the maximum-wage worker.²

After the year of initial eligibility (age 62 for retired worker benefits), the PIA is increased each year for the increase in the Consumer Price Index (CPI) measured by the percentage increase from the first quarter of one year to the first quarter of the next. Thus, the PIAs of \$314, \$468, and \$593 would have been for January through May 1982, and would have been increased by the 7.4 percent cost-of-living adjustment that raised the June 1982 benefits (received in July).

The actual benefit payable to the example workers, however, would be less than the PIA. Workers are eligible to receive retired worker benefits at age 62 only after an actuarial reduction. Thus, eligible workers may receive benefits before age 65, but only at reduced levels. For each month that payments are received before age 65, benefits are reduced by five-ninths of 1 percent reaching a maximum of a 20 percent reduction at age 62.

Transition Guarantee. The 1977 amendments changed the method used to compute benefits from the PIA table procedure based upon a worker's average monthly wage (AMW) to the procedure outlined in the preceding section based on the AIME. However, because the new method could have resulted in relatively large benefit reductions for workers very near retirement, the amendments also provided that individuals reaching age 62 between 1979 and 1983 would receive the higher of a transition benefit based on the old-law method or the benefit based on the new-law procedure.³

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2. The example minimum-wage worker would have been eligible for a special PIA of \$321 in January 1982 because of additional provisions designed to increase benefits for long-term low-wage workers. These provisions, known as the special minimum benefit, allow workers to have benefits calculated on the basis of the number of years of earnings when wages were at least 25 percent of the maximum taxable wage. A worker receives \$16.07 per month for each of these years in excess of 10 with the total not to exceed 20. The monthly dollar amounts are increased by the annual benefit increase: 7.4 percent in 1982. Thus, the June 1982 benefit for the example minimum-wage worker would be \$345.
 3. In fact, the transition guarantee did not prevent the occurrence of major differences between retirement cohorts. The rapid inflation of the 1979-1981 period caused the old-law guarantee to fall substantially

The AMWs for the hypothetical workers analyzed here are computed the same way as the AIME except that actual earnings rather than indexed earnings are used in the calculation. That is, the highest 26 years of earnings (for a worker reaching 62 in 1982) are totaled and then divided by 312.

The formula used to convert AMWs into PIAs was frozen in 1978 for the purposes of the transition guarantee. The formula is as follows: 155.38 percent of the first \$110 of AMW, 56.51 percent of the next \$290, 52.81 percent of the next \$150, 62.09 percent of the next \$100, 34.53 percent of the next \$100, 28.78 percent of the next \$250, 25.92 percent of the next \$175, 24.01 percent of the next \$100, 22.56 percent of the next \$100, and 21.30 percent of the next \$100. Applying this formula to the AMWs of the example workers yields PIAs of \$273, \$418, and \$540, respectively, for those earning the minimum, average, and maximum wage.

An important aspect of the transitional guarantee is that workers cannot use earnings after age 61 to increase their AMW and therefore the PIA. Earnings after age 61 may only be used to increase the PIA of workers reaching age 62 between 1979 and 1983 if the new-law formula is used.

Comparison of the PIAs under the new formula and under the transition guarantee indicates that, for the example workers, benefits would be based on the new formula. For some other workers, however, the guarantee would have yielded a higher benefit.

Differences in Benefit Computation for Disabled Workers and Survivors

While the computation of Social Security benefits for disabled workers and survivors is basically the same as for retired workers, there are some differences. These differences relate to the insured status requirements, the number of years of earnings to be included in the computation, the limitation on family maximum benefits, and the limitations on earnings for those receiving benefits.

Insured Status Requirements. In order for survivors to be eligible for benefits, the deceased worker would have had to be either fully insured or currently insured. To meet the fully insured requirement, a worker needs

in real value. This disparity, often referred to as the "notch problem," is highlighted by the \$119 difference between the June 1982 benefits payable to workers born in 1916 and 1917 respectively, both of whom had earned the taxable maximum wage each year since 1951.

one quarter of coverage for each year after 1950 or attainment of 21, whichever is later, and before reaching age 62 or age of death. Alternatively, if the deceased worker earned at least 6 quarters of coverage out of the last 13 calendar quarters preceding death--including the quarter in which death occurred--survivors' benefits are payable to children and to the surviving spouse if caring for a child under 18.⁴

Different insured status requirements also apply for disabled workers. In addition to the requirements for being fully insured, a worker must have earned 20 quarters of coverage out of the last 40 preceding the onset of the disability. If the onset of disability occurs before age 31, the worker must have earned one quarter of coverage for every two elapsing after turning 21 in order to be insured for disability benefits. However, a worker needs a minimum of six quarters of coverage.

Computation Period. The year in which eligibility benefits begins is determined by the year when a worker turns 62, becomes disabled, or dies. For example, if a worker became disabled at age 50 in 1982, the number of years of earnings considered for determining benefits is 1982 minus 1954 (the year in which age 22 was attained), or 28. The lowest five years of earnings are dropped from the benefit computation, resulting in an averaging period of 23 years. The determination of the averaging period for a worker dying in 1982 would be identical.

Disabled workers under 47 are allowed fewer dropout years than other workers. Under the 1980 amendments, the number of dropout years for disabled workers is related to the age of eligibility, as shown below:

<u>Age at Onset of Disability</u>	<u>Dropout Years</u>
Under 27	0
27-31	1
32-36	2
37-41	3
42-46	4
Over 46	5

Earnings are indexed in the same manner as for retired workers, with average annual earnings in the economy two years prior to eligibility

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4. After 1983, only surviving spouses with children under 16 will be eligible to receive survivors' benefits prior to age 60 when they become eligible for widows' or widowers' benefits.

serving as the base. In addition, the same PIA formula is used for anyone becoming eligible in a given year.

Limitation on Family Maximum Benefits. The maximum benefit payable to a family of a disabled worker based upon the worker's PIA is different from that for retirement and survivor families. Under the 1980 amendments, the maximum family disability benefit is equal to 85 percent of the AIME or 150 percent of the PIA, whichever is lower but not less than the PIA. The stricter limit for disability benefits is designed to provide family benefits that are less likely to exceed the worker's predisability earnings than was the situation prior to the amendments.

Limitations on Earnings. Benefits payable to survivors are reduced for earnings in the same way as they are for retired workers and their spouses. In 1982 the exempt earnings amount for survivors 65 and over is \$6,000, and for those under 65 it is \$4,440. For every two dollars of earnings above the exempt amount, benefits are reduced by one dollar.

For disabled workers, a different earnings limit applies. In order to qualify for disability benefits, monthly earnings must not exceed \$300 a month in 1982. For those already receiving benefits, continued earnings near or above this level lead to a complete termination of benefits.

Benefits Payable to Other Persons Based on the Worker's PIA

Other persons besides the insured worker may receive Social Security benefits based on a worker's earnings record. These include the worker's spouse, minor children, and survivors. Benefits payable to persons other than the insured worker are often referred to as dependents' benefits, although no proof of dependency is required. They are also known as auxiliary benefits. Auxiliary benefits are generally some percentage of the insured worker's PIA. For example, a spouse aged 65 is eligible, if the insured worker applies for and is awarded benefits, for 50 percent of the worker's PIA. Table A-2 lists the benefits for auxiliary beneficiaries as a percentage of the worker's PIA.

TABLE A-2. MONTHLY AUXILIARY BENEFITS AS A PERCENTAGE OF THE WORKER'S PRIMARY INSURANCE AMOUNT FOR SELECTED BENEFICIARIES

Type of Benefit	Percent of PIA
Based on PIA of Retired Worker^a	
Spouse ^b	
Age 65	50.0
Age 62	37.5
If caring for child under 18 ^c	50.0
Children and dependent grandchildren	50.0
Based on PIA of Disabled Worker^a	
Spouse ^b	
Age 65	50.0
Age 62	37.5
If caring for child under 18 ^c	50.0
Children and dependent grandchildren	50.0
Based on PIA of Deceased Worker^a	
Widows and widowers ^b	
Age 65 ^d	100.0
Age 60	71.5
Age 50 (only if disabled)	50.0
Widows and widowers with care of child ^{b,c}	75.0
Dependent parent, age 62 ^e	82.5
Children	75.0

NOTE: For a more detailed list, see Social Security Bulletin: Annual Statistical Supplement, 1980, pp. 26-28.

- a. Actual benefits subject to the maximum family benefit limitation and the beneficiary's earnings.
- b. Includes divorced spouse if the marriage lasted at least ten years.
- c. Public Law 97-35, the Omnibus Reconciliation Act of 1981, amended the Social Security Act to eliminate payments to a parent caring for a child when the youngest child reaches age 16. Provision will be fully effective in September 1983.
- d. Actual benefits generally cannot exceed those the deceased worker would be receiving if still alive, with some exceptions.
- e. If both parents receive benefits, benefits are limited to 75 percent of PIA for each.

APPENDIX B. LONG-RANGE COST PROJECTIONS

Each year the trustees of the Old-Age, Survivors, and Disability Insurance programs are required to report to the Congress on the operations and financial outlook of the Social Security trust funds. The Social Security Act (Sec. 201(c)) specifically requires that the Trustees' Report "include a statement of the assets of, and the disbursements made from, the trust funds during the preceding fiscal year, an estimate of the expected income to, and disbursements to be made from, the trust funds during each of the next ensuing five fiscal years, and a statement of the actuarial status of the trust funds." Currently, the actuarial status is assessed based on the projected operations of the trust funds over the ensuing 75 years. While projections are always uncertain and the uncertainty grows with the length of the projection period, the 75-year estimates are designed to inform the Congress of the potential need for legislative action. Also, as a reflection of the uncertainty, three different sets of assumptions (optimistic, intermediate, and pessimistic) are employed in the estimates of actuarial status to provide a range of possible future outcomes.¹

This appendix presents a brief overview of the basic methodology used by the Office of the Actuary of the Social Security Administration to estimate program costs. It first describes the demographic and economic assumptions used by the actuaries with heavy emphasis placed on the intermediate B assumptions. The second section of this appendix summarizes how these assumptions are translated into taxable payroll--the traditional measure for evaluating Social Security costs. Next, the appendix discusses the procedure used to produce earnings histories of future beneficiaries and, thus, future benefits.

Demographic and Economic Assumptions

The 1982 Trustees' Report employs three sets of demographic assumptions and four sets of economic assumptions. The various sets of assumptions are constructed to describe circumstances representing a reasonable range of outlooks for the trust funds. Thus, optimistic, intermediate, and pessimistic demographic assumptions are combined with

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1. The 1981 and 1982 Trustees' Reports contained a fourth set of economic assumptions based on the Administration's budget assumptions.

optimistic, intermediate (two sets), and pessimistic economic assumptions to provide four basic scenarios.

Demographic Assumptions. Projections of Social Security costs are highly sensitive to factors such as rates of fertility, mortality, and disability incidence. In addition, other factors (such as rates of immigration, marriage, and divorce) are important to the estimates of the composition of the working-age and beneficiary populations.

Table B-1 contains the trustees' assumptions regarding selected demographic factors. For each set of assumptions, the level of net immigration is assigned a limit of 400,000 per year.

As indicated in Table B-1, the ultimate rates for total fertility vary from 2.4 in the optimistic scenario to 1.7 in the pessimistic one, with the intermediate assumptions containing a 2.1 rate. Such differences can substantially affect program costs, particularly during the later portion of the projection period.² For example, if the ultimate total fertility rate proved to be 2.0 rather than 2.1 and all other assumptions were realized, OASDI costs as a percentage of taxable payroll would be 0.27 percent higher on average for the next 75 years, but in the period 2032 to 2056 costs would increase by 0.65 percent of taxable payroll.

Mortality rates, which declined rapidly during the 1970s, are expected to continue to decrease, but the trustees foresee a slowdown in the rate of decrease. The life-expectancy projections shown in Table B-1 assume mortality improvements from 1978 to 2060 of 22 percent (optimistic), 37 percent (intermediate), and 59 percent (pessimistic).³ The intermediate rate is roughly equivalent to a rate of mortality improvement half that which has already occurred in this century. The impact of the mortality rate can be substantial; for example, the cost increases by 1.46 percent of taxable payroll when the 59 percent improvement in the pessimistic projections is substituted for the 37 percent rate in the intermediate projections.

Economic Assumptions. The financial condition of the Social Security system is highly variable depending upon the performance of the economy. Most important among the economic factors affecting program costs is the

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2. See 1982 Trustees' Report, Appendix B, for an analysis of the sensitivity of projected OASDI costs to changes in assumptions.
 3. The reader is again reminded that the terms pessimistic and optimistic refer only to the effect of various assumptions on trust fund balances.

TABLE B-1. SELECTED DEMOGRAPHIC ASSUMPTIONS BY ALTERNATIVE, 1960-2060

Calendar Year	Total Fertility Rate ^a	Life Expectancy ^b			
		At birth		At age 65	
		Male	Female	Male	Female
Past Experience					
1960	3.61	66.7	73.4	13.0	16.1
1965	2.88	66.8	74.1	13.0	16.6
1970	2.43	67.1	74.9	13.2	17.2
1975	1.77	68.7	76.5	13.7	18.1
1980	1.84	69.8	77.7	14.3	18.7
Optimistic					
1985	1.96	70.4	78.3	14.5	19.1
1990	2.07	70.9	78.9	14.8	19.4
1995	2.18	71.2	79.2	14.9	19.7
2000	2.29	71.4	79.4	15.0	19.8
2005	2.40	71.5	79.5	15.1	19.9
2010	2.40	71.6	79.6	15.2	20.0
2020	2.40	71.8	79.9	15.3	20.2
2030	2.40	72.0	80.1	15.5	20.4
2040	2.40	72.2	80.3	15.6	20.6
2050	2.40	72.4	80.6	15.7	20.8
2060	2.40	72.6	80.8	15.9	21.0
Intermediate					
1985	1.90	71.0	78.9	14.8	19.5
1990	1.95	71.9	80.0	15.3	20.3
1995	2.00	72.6	80.8	15.6	20.8
2000	2.05	72.9	81.1	15.8	21.1
2005	2.10	73.2	81.4	16.0	21.4
2010	2.10	73.4	81.6	16.1	21.6
2020	2.10	73.8	82.1	16.4	22.0
2030	2.10	74.2	82.6	16.7	22.4
2040	2.10	74.6	83.1	17.0	22.8
2050	2.10	75.0	83.6	17.3	23.2
2060	2.10	75.4	84.1	17.6	23.6
Pessimistic					
1985	1.82	72.1	80.2	15.3	20.4
1990	1.79	74.0	82.5	16.3	22.1
1995	1.76	75.3	84.1	17.0	23.5
2000	1.73	75.9	84.9	17.4	24.2
2005	1.70	76.4	85.5	17.8	24.7
2010	1.70	76.8	86.0	18.1	25.1
2020	1.70	77.7	87.2	18.8	26.1
2030	1.70	78.5	88.3	19.5	27.2
2040	1.70	79.4	89.5	20.1	28.2
2050	1.70	80.2	90.6	20.8	29.3
2060	1.70	81.0	91.8	21.5	30.4

- a. The total fertility rate for any year is the average number of children who would be born to a woman in her lifetime if she experienced the birth rates by age observed in, or assumed for, the selected year, and if she survived the entire child-bearing period.
- b. The life expectancy for any year is the average number of years of life that would remain to a person if that person experienced the death rates by age assumed for the selected year.

rate of growth in productivity and in real wages. Assumptions about unemployment, labor force participation, interest rates, and price growth also influence projected OASDI costs.

Four sets of economic assumptions are used in the 1982 Trustees' Report. Because the long-range cost estimates in this paper are based on the Alternative II-B assumptions, Table B-2 presents the complete set of assumptions for this alternative only. Also shown, however, are the economic assumptions for the other alternatives for the year 2000 and beyond.

Because revenues to the OASDI trust funds are derived from a payroll tax, and benefits, after initial eligibility, are price indexed, the difference between the growth in nominal wages and the growth in the price level largely determines the payroll tax required to support future benefits payable under current law. If this real wage differential was 2.0 percent (as in the intermediate A assumptions) as opposed to 1.5 (as in the intermediate B assumptions), the average annual cost rate over the 1982-2056 period would fall by 0.77 percent of taxable payroll. The compounded effect of this real wage differential is demonstrated by the 0.39 percentage-point reduction for the first 25 years compared with the 1.08 reduction for the last 25 years of the 75-year projection period.

Estimation of Taxable Payroll

Taxable payroll--wages in covered employment that fall below the taxable maximum--is an important concept for understanding Social Security costs. Evaluating program costs as a percentage of taxable payroll facilitates comparison of the impact of different program changes in terms of the changes in the payroll tax rate required to finance them. Thus, the 75-year average deficit of 1.82 percent of taxable payroll indicates that a corresponding increase in the combined employee-employer rate would bring the program into balance on average, although the trust funds would experience large surpluses in some years and large deficits in others.

The Office of the Actuary of the Social Security Administration constructs its estimates of taxable payroll in the following manner. First, the assumptions decided upon by the trustees are used as constraints on the population and the performance of the economy. Estimates of the economy's performance for the near term are derived from the large-scale macroeconomic model maintained by the Social Security Administration's Office of Research and Statistics. These projections are used for the first ten years of the 75-year projection period. Assumptions about the growth rates for GNP, labor force size, prices, and other economic variables for the

near term are fed into the model and a distribution of earnings is generated by the model. The economy is assumed to follow a noncyclical growth pattern that, after ten years, attains the ultimate long-run growth rates contained in the long-run assumptions. For example, by 1992 under the intermediate B assumptions, the real wage differential equals 1.5 percent, productivity growth is 2.2 percent, unemployment is 5 percent, and the Consumer Price Index is rising at 4 percent per year.

Taxable payroll is determined by applying Social Security coverage rates on the labor force and by imposing the taxable maximum earnings limitation on the distribution of wages and salaries in the economy. In addition, separate estimates are made for the taxable earnings of the self-employed. After the initial ten-year period, taxable payroll is projected based upon the assumed growth in nominal covered wages and in the size of the labor force.

Taxable payroll under the trustees' assumptions grows less rapidly than productivity for two basic reasons. First, hours worked per year are expected to continue to decline as they have historically, at a rate of 0.3 percent annually. Second, fringe benefits as a proportion of total labor compensation are projected to continue to grow.⁴ Since payroll taxes are based on money wages, these trends result in a payroll tax base that is a declining portion of GNP. GNP is projected by taking the estimate of taxable payroll and, using relationships between the real wage differential and productivity growth, translating the real growth in taxable payroll into the real growth in potential GNP.⁵ It is assumed that GNP under each set of assumptions will grow, after 1991, at the same rate as potential GNP.

Projection of OASDI Costs

The costs of the OASDI programs are projected using a weighted sample of current beneficiaries and workers designed to represent the

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4. See Yung-Ping Chen, "The Growth of Fringe Benefits Implications for Social Security," Monthly Labor Review, November 1981, pp. 3-10; and John C. Wilkin, Ronald V. Gresch, and Milton P. Glanz, "Growth in Fringe Benefits," Actuarial Note Number 113, Social Security Administration, June 1982.
 5. For a more detailed description, refer to Harry J. Kingerski, "Projecting OASDI Long-Range Program Cost as a Percentage of Gross National Product," Actuarial Note Number 99, Social Security Administration, January 1980.

TABLE B-2. SELECTED ECONOMIC ASSUMPTIONS, 1960-2060

Calendar Year	Average Annual Percentage Increase in				Average Annual Interest Rate ^c (percent)	Average Annual Unemployment Rate ^d (percent)
	Real GNPa	Average wages in covered employment	Consumer Price Index	Real-wage Differential ^b (percent)		
Past Experience						
1960-1964	4.0	3.4	1.3	2.1	3.7	5.7
1965-1969	4.4	5.4	3.4	2.0	5.2	3.8
1970	-0.2	4.9	5.9	-1.0	7.3	4.9
1971	3.4	4.9	4.3	0.6	6.0	5.9
1972	5.7	7.3	3.3	4.0	5.9	5.6
1973	5.8	6.9	6.2	0.7	6.6	4.9
1974	-0.6	7.4	11.0	-3.6	7.5	5.6
1975	-1.1	6.6	9.1	-2.5	7.4	8.5
1976	5.4	8.2 ^e	5.7	2.5 ^e	7.1	7.7
1977	5.5	8.0 ^e	6.5	1.5 ^e	7.1	7.0
1978	4.8	8.2 ^e	7.6	0.6 ^e	8.2	6.0
1979	3.2	8.8 ^e	11.4	-2.6 ^e	9.1	5.8
1980	-0.2	8.6 ^e	13.5	-4.9 ^e	11.0	7.1
Intermediate B						
1981	1.8 ^f	8.6	10.3	-1.7	13.3	7.6
1982	-0.8	6.6	6.9	-0.3	13.0	9.1
1983	4.2	8.1	7.9	0.2	11.4	8.5
1984	3.3	8.1	7.4	0.7	9.3	8.0
1985	3.0	6.9	6.6	0.3	8.0	7.7
1986	3.0	6.8	5.8	1.0	7.1	7.4
1987	3.0	6.6	5.5	1.1	6.8	7.1
1988	3.0	6.6	5.3	1.3	6.6	6.8
1989	3.0	6.4	4.9	1.5	6.5	6.4
1990	3.0	6.0	4.5	1.5	6.4	6.1
1995	2.5	5.5	4.0	1.5	6.1	5.0
2000 & Later	2.6 ^g	5.5	4.0	1.5	6.1	5.0

(Continued)

TABLE B-2. (Continued)

Calendar Year	Average Annual Percentage Increase in				Average Annual Interest Rate ^c (percent)	Average Annual Unemployment Rate ^d (percent)
	Real GNP ^a	Average wages in covered employment	Consumer Price Index	Real-Wage Differential ^b (percent)		
Optimistic						
2000 & Later	3.5g	4.5	2.0	2.5	5.1	4.0
Intermediate A						
2000 & Later	3.1g	5.0	3.0	2.0	5.6	5.0
Pessimistic						
2000 & Later	2.1g	6.0	5.0	1.0	6.6	6.0

- a. Real GNP is the total output of goods and services expressed in constant dollars.
- b. The difference between the percentage increase in average annual wages in covered employment and the percentage increase in the average annual CPI.
- c. The average of the interest rates determined in each of the 12 months of the year for special public-debt obligations issuable to the trust funds.
- d. Adjusted by age and sex based on the total labor force aged 16 and over as of July 1, 1970. Rates shown for earlier years are civilian unemployment rates for those years.
- e. Preliminary.
- f. The actual value of the 1981 increase in real GNP was 2.0 percent. This value was not available at the time the cost estimates were prepared; the cost estimates were based on the assumed increases in real GNP shown under the four alternatives.
- g. This value is for the year 2000. The annual percentage increase in real GNP is assumed to continue to change after 2000 under each alternative to reflect the dependence of labor force growth on the size and age-sex distribution of the population. The percentage increases for 2060 are 3.4, 2.5, 2.1, and 1.0 for alternatives I, II-A, II-B, and III, respectively.

population of beneficiaries over the next 75 years.⁶ Separate projections of numbers of beneficiaries and average benefits for each type of beneficiary are made. Although expenditures are made for program administration, vocational rehabilitation, and transfers to the railroad retirement fund, benefit payments represent more than 97 percent of all OASDI outlays. Therefore, this section concentrates on the estimate of benefit payments.

In order to project the benefits of future cohorts of recipients, earnings histories must also be projected. Under the current practice of the Office of the Actuary, these projections are based primarily on the earnings histories of individuals becoming eligible for benefits in 1977. These data are selected from the Continuous Work History Sample (CWHS), which contains the records of 1 percent of all persons ever awarded a Social Security number. The file used by the actuaries reduces this number of records by taking a 7 percent subsample. The result of the sampling is a data file containing 1,378 beneficiaries, including retired workers, disabled workers, and survivors. This basic file is further supplemented with records from the CPS-IRS-SSA Exact Match file in order to take into account the possibility that the composition of the beneficiary population could change. For this purpose, 200 records of uninsured workers, primarily women, were added to the file. Finally, to reflect the fact that some people never work, over 100 records of hypothetical persons age 62 were included. The file, therefore, contains 1,689 individual records.

Cost estimates for OASDI require that files comparable to that described above must be projected into the future. In fact, files are constructed for each year through 1990, and quinquennially for the remainder of the 75-year projection period. Through the year 2000, certain assumptions are used to yield reasonable earnings histories. In 1977, the yearly earnings records for the sample span only the 1951-1977 period; for an age-65 retiree this would have represented only earnings from age 39 forward. After adjusting for the bias caused by the taxable maximum earnings limit, the earnings records are expanded to cover the years 1951-2000 by duplicating randomly selected years of earnings. These earnings paths reflect the actuaries' assumptions about age-sex specific labor force participation rates and the observed growth in earnings at younger ages. After 2000, the earnings for the sample are increased to reflect the assumptions about the growth in average wages.

6. This discussion relies heavily upon a more complete description of the methodology contained in Steven F. McKay, "Long-Range Projection of Average Benefits Under OASDI," Actuarial Note Number 108, Social Security Administration, September 1981.