THE 2003 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND DISABILITY INSURANCE TRUST FUNDS

COMMUNICATION

FROM

THE BOARD OF TRUSTEES, FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND DISABILITY INSURANCE TRUST FUNDS

TRANSMITTING

THE 2003 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND THE FEDERAL DISABILITY INSURANCE TRUST FUNDS

LETTER OF TRANSMITTAL

BOARD OF TRUSTEES OF THE
FEDERAL OLD-AGE AND SURVIVORS INSURANCE
AND DISABILITY INSURANCE TRUST FUNDS,
Washington, D.C., March 17, 2003

The Honorable J. Dennis Hastert
Speaker of the House of Representatives
Washington, D.C.

The Honorable Richard B. Cheney
President of the Senate
Washington, D.C.

Gentlemen:

We have the honor of transmitting to you the 2003 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance Trust Fund and the Federal Disability Insurance Trust Fund, the 63d such report.

Respectfully,

/S/
John W. Snow, *Secretary of the Treasury, and Managing Trustee of the Trust Funds.*

/S/
Elaine L. Chao, *Secretary of Labor, and Trustee.*

/S/
Tommy G. Thompson, *Secretary of Health and Human Services, and Trustee.*

/S/
Jo Anne B. Barnhart, *Commissioner of Social Security, and Trustee.*

/S/
John L. Palmer, *Trustee.*

/S/
Thomas R. Saving, *Trustee.*

/S/
James B. Lockhart III, *Deputy Commissioner of Social Security, and Secretary, Board of Trustees.*

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THE 2003 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND DISABILITY INSURANCE TRUST FUNDS

I. INTRODUCTION

The Board of Trustees reports each year on the current and projected financial condition of the Social Security program, which is financed through two separate trust funds. The Old-Age and Survivors Insurance (OASI) Trust Fund pays monthly benefits to retired workers and their families and to survivors of deceased workers. The Disability Insurance (DI) Trust Fund pays monthly benefits to disabled workers and their families.

The report on the current financial status of the funds includes an accounting of the actual income and expenditures for the last year. The projections for future years reflect the Trustees' considered judgment about all the demographic, economic, and program factors that affect income and expenditures. Projections are presented separately for the next 10 years (the short range) and for the next 75 years (the long range). All projections are based on current Social Security law and do not anticipate any future changes that Congress might make.

Because any projection of future experience is uncertain, the Trustees use three alternative sets of assumptions to show a range of possible outcomes. The intermediate set of assumptions, designated as alternative II, reflects the Trustees' best estimate of the trust funds' future financial outlook; the low cost alternative I is more optimistic, and the high cost alternative III more pessimistic. As a further illustration of the uncertainty associated with projections, this report includes a new stochastic, or probabilistic, projection that provides a distribution of possible outcomes around the intermediate case. This new projection is described in some detail in appendix E.

In recent years the Trustees Report has characterized sustainable solvency as maintaining a trust fund balance that is positive and either level or increasing as a percent of the annual cost of the program at the end of the 75-year period. In this report the Trustees provide an additional indicator that measures the degree of solvency over the infinite future.

For this report, demographic, economic, and programmatic factors have been updated with the most recently available information. Compared to the results shown in last year's report, projected annual balances for the Social Security program (income minus costs) are slightly smaller in some years and slightly higher in others. Moving the valuation date from 2002 to 2003 has increased the program's actuarial deficit and unfunded obligation. Overall, however, the projected financial status of the program shows little change.

II. OVERVIEW

A. HIGHLIGHTS

The report's major findings are summarized below.

In 2002

At the end of 2002, 46 million people were receiving benefits: 32 million retired workers and their dependents, 7 million survivors of deceased workers, and 7 million disabled workers and their dependents. During the year an estimated 153 million people had earnings covered by Social Security and paid payroll taxes. Total benefits paid in 2002 were $454 billion. Income was $627 billion, and assets held in special issue U.S. Treasury securities grew to $1.4 trillion.

Short-Range Results

The OASI and DI Trust Funds, individually and combined, are adequately financed over the next 10 years under the intermediate assumptions. The combined assets of the OASI and DI Trust Funds are projected to increase from $1,378 billion at the beginning of 2003, or 288 percent of annual expenditures, to $3,556 billion at the beginning of 2012, or 452 percent of annual expenditures in that year. Combined assets were projected in last year's report to rise to 288 percent of annual expenditures at the beginning of 2003, and 505 percent at the beginning of 2012.

Long-Range Results

Under the intermediate assumptions the combined OASI and DI Trust Funds are projected to become exhausted in 2042. The projected actuarial deficit is 1.92 percent of taxable payroll, 0.04 percentage point larger than in last year's report. Between about 2010 and 2030, OASDI costs will increase rapidly due to the retirement of the large baby-boom generation, and annual costs will exceed tax income starting in 2018. After 2030, increases in life expectancy and relatively low fertility rates will continue to increase Social Security system costs, but more slowly. The OASDI annual cost rate is projected to increase from 10.89 percent of taxable payroll in 2003 to 19.92 percent in 2077, or 6.50 percent of taxable payroll more than the projected income rate. Expressed in relation to the projected gross domestic product (GDP), OASDI costs are estimated to rise from the current level of 4.4 percent of GDP to 7.0 percent in 2077. Separately, the DI fund is projected to be exhausted in 2028 and the OASI fund in 2044.

Solvency

The combined OASDI Trust Funds are projected to become insolvent in 2042 under the long-range intermediate assumptions. For the trust funds to remain solvent throughout the 75-year projection period, the combined payroll tax rate could be increased immediately by 1.92 percentage points, benefits could be reduced immediately by 13 percent, a transfer of $3.5 trillion in general revenue (in net present value) could be made, or some combination of approaches could be adopted. Significantly larger changes, would be required to achieve solvency beyond 75 years.

B. TRUST FUND FINANCIAL OPERATIONS IN 2002

The table below shows the income, expenditures, and assets for the OASI, the DI and the combined OASDI Trust Funds in calendar year 2002.

Table II.B1.—Summary of 2002 Trust Fund Financial Operations

	Amounts (in billions)		
	OASI	DI	OASDI
Assets at the end of 2001	$1,071.5	$141.0	$1,212.5
Total income in 2002	539.7	87.4	627.1
Net contributions	455.2	77.3	532.5
Taxation of benefits	12.9	.9	13.8
Interest	71.2	9.2	80.4
Transfer from General Fund of the Treasury	.4	—	.4
Total expenditures in 2002	393.7	67.9	461.7
Benefit payments	388.1	65.7	453.8
Railroad Retirement financial interchange	3.5	.2	3.6
Administrative expenses	2.1	2.0	4.2
Net increase in assets in 2002	146.0	19.5	165.4
Assets at the end of 2002	1,217.5	160.5	1,378.0

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

In 2002, 85 percent of total trust fund income consisted of net contributions, comprising taxes paid by employees, employers and the self-employed on earnings covered by Social Security. These taxes were paid on covered earnings up to a specified maximum annual amount, which was $84,900 in 2002 and is increased each year automatically (to $87,000 in 2003) as the average wage increases. The tax rates scheduled under current law for 2002 and later are shown in table II.B2.

Table II.B2.—Tax Rates for 2002 and Later

	OASI	DI	OASDI
Tax rate for employees and employers, each (in percent)	5.30	0.90	6.20
Tax rate for self-employed persons (in percent)	10.60	1.80	12.40

Two percent of OASDI Trust Fund income came from subjecting up to 50 percent of Social Security benefits above a certain level to Federal personal income taxation, and 13 percent of OASDI income came from interest earned on investment of OASDI Trust Fund reserves. Social Security's assets are invested in interest-bearing securities of the U.S. Government. In 2002 the combined trust fund assets earned interest at an effective annual rate of

6.4 percent. More than 98 percent of expenditures from the combined OASDI Trust Funds in 2002 went to pay retirement, survivor, and disability benefits totaling $453.8 billion. The financial interchange with the Railroad Retirement program resulted in a payment of $3.6 billion from the combined OASDI Trust Funds, or about 0.8 percent of total expenditures. The administrative expenses of the Social Security program were $4.2 billion, or about 0.9 percent of total expenditures.

Assets of the trust funds provide a reserve to pay benefits whenever expenditures exceed income. Assets increased by $165.4 billion in 2002 because income to each fund exceeded expenditures, as shown in table II.B1. At the end of 2002, the combined assets of the OASI and the DI Trust Funds were 288 percent of estimated expenditures for 2003.

C. ASSUMPTIONS ABOUT THE FUTURE

The actual future income and expenditures of the OASI and DI Trust Funds depend on many factors, including the size and characteristics of the population receiving benefits, the level of monthly benefit amounts, the size of the work force, and the level of workers' earnings. These factors will depend in turn upon future birth rates, death rates, immigration, marriage and divorce rates, retirement-age patterns, disability incidence and termination rates, productivity gains, wage increases, inflation, and many other demographic, economic, and program-specific factors.

The intermediate set of assumptions shown in table II.C1, designated as alternative II, reflects the Trustees' best estimates of future experience, and therefore most of the figures in this overview depict only the outcomes under the intermediate assumptions. Any projection of the future is, of course, uncertain. For this reason, alternatives I and III are included to provide a range of possible future experience. The assumptions for these two alternatives are also shown in table II.C1, and their implications are highlighted in a separate section on the uncertainty of the projections.

Assumptions are reexamined each year in light of recent experience and new information. This careful review and updating of the assumptions on an annual basis helps ensure that they provide the Trustees' best estimate of future possibilities.

Table II.C1.—Ultimate Values of Key Demographic and Economic Assumptions

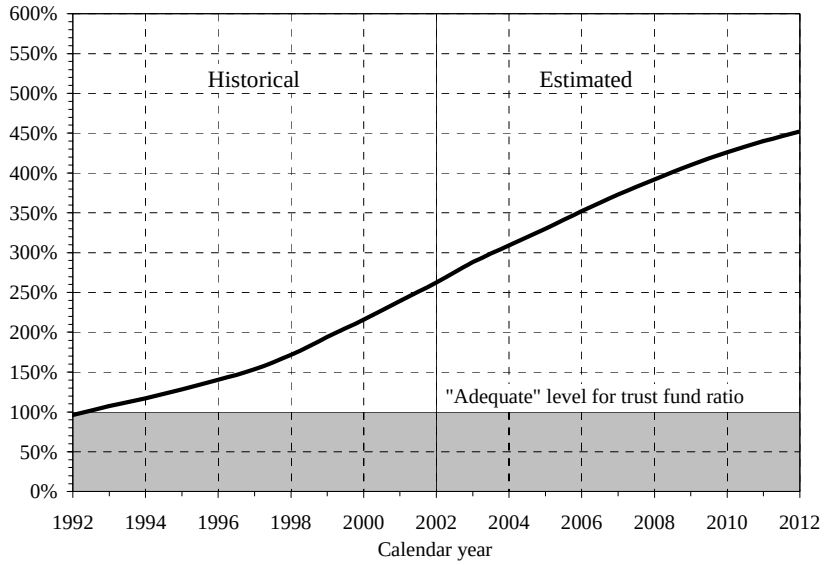
Ultimate assumptions	Intermediate	Low Cost	High Cost
Total fertility rate (children per woman)	1.95	2.2	1.7
Average annual percentage reduction in total age-sex-adjusted death rates from 2027 to 2077	.73	.34	1.27
Annual net immigration (in thousands)	900	1,300	672.5
Annual percentage change in:			
Average wage in covered employment	4.1	3.6	4.6
Consumer Price Index (CPI)	3.0	2.0	4.0
Real-wage differential (percent)	1.1	1.6	.6
Productivity (total U.S. economy)	1.6	1.9	1.3
Unemployment rate (percent)	5.5	4.5	6.5
Annual trust fund interest rate (percent)	6.0	5.7	6.2

D. PROJECTIONS OF FUTURE FINANCIAL STATUS

Short-Range Actuarial Estimates

For the short range (2003-2012), the Trustees measure trust fund adequacy by comparing assets at the beginning of each year to projected expenditures for that year under the intermediate set of assumptions. Having a trust fund ratio of 100 percent or more—that is, assets at the beginning of each year at least equal to projected outgo during the year—is considered a good indication of a trust fund's ability to cover most short-term contingencies. Both the OASI and the DI trust fund ratios under the intermediate assumptions exceed 100 percent throughout the short-range period and therefore satisfy the Trustees' short-term test for financial adequacy. Figure II.D1 below shows the trust fund ratios for the combined OASI and DI Trust Funds for the next 10 years.

Figure II.D1.—Short-Range OASDI Trust Fund Ratios
[Assets as a percentage of annual expenditures]



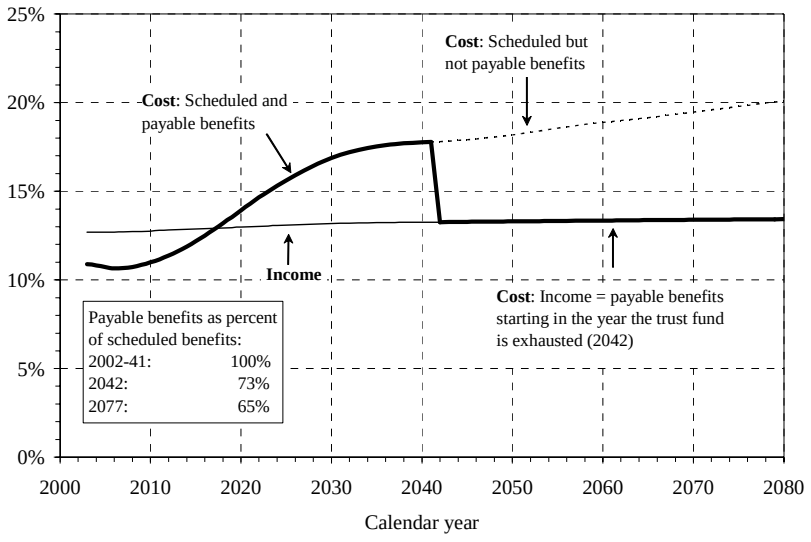
Long-Range Actuarial Estimates

The financial status of the trust funds over the next 75 years is measured in terms of costs and income as a percentage of taxable payroll, trust fund ratios, the actuarial balance (also as a percentage of taxable payroll), and the open group unfunded obligation (expressed in present-value dollars). Con-

sidering Social Security's cost as a percentage of the total U.S. economy (gross domestic product or GDP) provides an additional perspective.

The year-by-year relationship of the income and cost rates shown in figure II.D2 illustrates the expected pattern of cash flow for the OASDI program over the full 75-year period. Under the intermediate assumptions, the OASDI cost rate is projected to decline slightly and then remain flat for the next several years. It then begins to increase rapidly and first exceeds the income rate in 2018, producing cash-flow deficits thereafter. Despite these cash-flow deficits, trust fund interest earnings and assets will allow continuation of full benefit payments until 2042, when the trust funds will be exhausted. Pressures on the Federal Budget will thus emerge well before 2042. Even if a trust fund's assets are exhausted, however, tax income will continue to flow into the fund. Present tax rates would be sufficient to pay 73 percent of scheduled benefits after trust fund exhaustion in 2042 and 65 percent of scheduled benefits in 2077.

Figure II.D2.—OASDI Income and Cost Rates Under Intermediate Assumptions

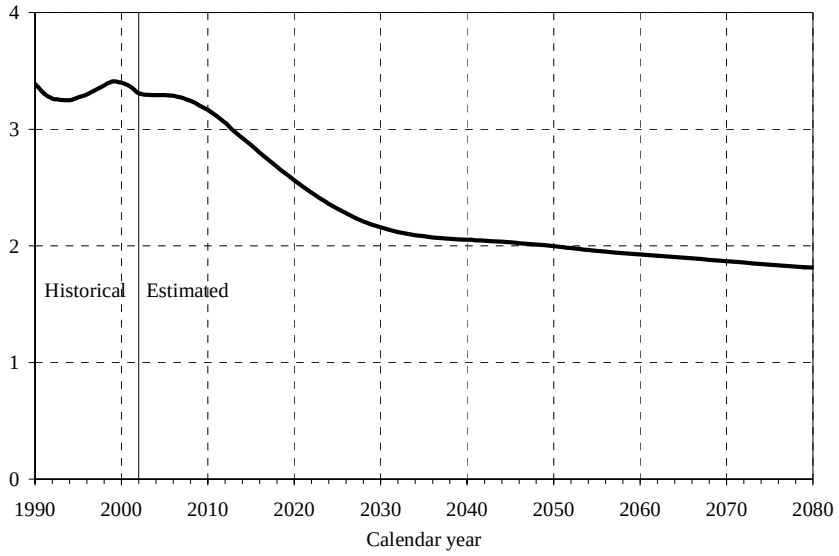


Social Security's cost rate generally will continue rising through about 2030 as the baby-boom generation reaches retirement age. Thereafter, the cost rate is estimated to rise at a slower rate for about 15 years as the baby boom ages and begins to decrease in size. Continued reductions in death rates and relatively low birth rates will cause a significant upward shift in the average age

of the population and will push the cost rate to nearly 20 percent of taxable payroll by 2077 under the intermediate assumptions. In a pay-as-you-go system such as OASDI, this 20-percent cost rate means the combination of the payroll tax (now totaling 12.4 percent) and proceeds from income taxes on benefits (expected to be 1.0 percent of taxable payroll in 2077) would have to equal 20 percent to pay all currently scheduled benefits. Although the annual projections do not extend beyond 2077, the upward shift in the average age of the population is likely to continue and to increase the gap between OASDI costs and income.

The primary reason that the OASDI cost rate will increase rapidly between 2010 and 2030 is that, as the large baby-boom generation born in the years 1946 through 1964 retires, the number of beneficiaries will increase much more rapidly than the number of workers. The estimated number of workers per beneficiary is shown in figure II.D3. In 2002, there were about 3.3 workers for every OASDI beneficiary. The baby-boom generation will have largely retired by 2030, and the projected ratio of workers to beneficiaries will be only 2.2 at that time. Thereafter, the number of workers per beneficiary will slowly decline, and the OASDI cost rate will continue to increase.

Figure II.D3.—Number of Covered Workers Per OASDI Beneficiary



The maximum projected trust fund ratios for the OASI, DI, and combined funds appear in table II.D1. The year in which the maximum projected trust

fund ratio is attained and the year in which the assets are projected to be exhausted are shown as well.

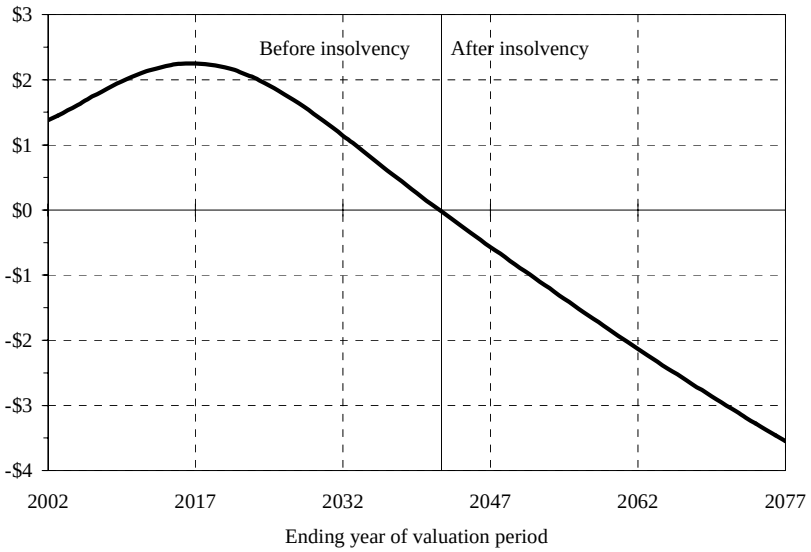
Table II.D1.—Projected Maximum Trust Fund Ratios Achieved and Trust Fund Exhaustion Dates Under the Intermediate Assumptions

	OASI	DI	OASDI
Maximum trust fund ratio (percent)	526	226	471
Year attained	2016	2007	2016
Year of exhaustion	2044	2028	2042

The actuarial balance is a measure of the program's financial status for the 75-year valuation period as a whole. It is essentially the difference between income and cost of the program expressed as a percentage of taxable payroll over the valuation period. This single number summarizes the adequacy of program financing for the period. When the actuarial balance is negative, the actuarial deficit can be interpreted as the percentage that would have to be added to the current law income rate in each of the next 75 years, or subtracted from the cost rate in each year, to bring the funds into actuarial balance. In this report, the actuarial balance under the intermediate assumptions is a deficit of 1.92 percent of taxable payroll for the combined OASI and DI Trust Funds. The actuarial deficit was1.87 percent in the 2002 report and has been in the range of 1.46 percent to 2.23 percent for the last ten reports.

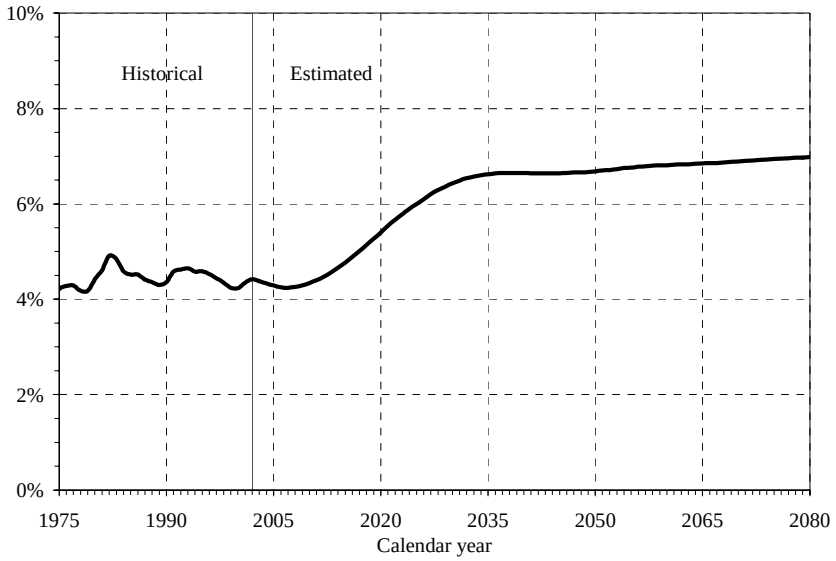
Another way to illustrate the financial shortfall of the OASDI system is to examine the cumulative value of taxes less costs, in present value. Figure II.D4 shows the present value of cumulative OASDI taxes less costs over the next 75 years. The balance of the combined trust funds peaks at $2.3 trillion in 2017 (in present value) and then turns downward. Through the end of 2077, the combined funds have a present-value unfunded obligation of $3.5 trillion.

Figure II.D4.—Cumulative OASDI Income Less Cost, Based on Present Law Tax Rates and Scheduled Benefits
[Present value as of 1-1-2003, in trillions]



Still another important way to look at Social Security's future is to view its cost as a share of the U.S. economy. Figure II.D5 shows that Social Security's cost as a percentage of GDP will grow 1.6 times from 4.4 percent in 2002 to 7.0 percent in 2077. Over the same period, the cost of Social Security expressed as a percentage of taxable payroll will grow from 10.95 percent to 19.92 percent.

Figure II.D5.—OASDI Cost as a Percentage of GDP



Even a 75-year period is not long enough to provide a complete picture of Social Security's financial condition. Figures II.D6 and II.D7 show that the program's financial condition continues to worsen at the end of the period. Some experts have noted that overemphasis on summary measures for a 75-year period can lead to incorrect perceptions and to policy prescriptions that do not move towards a sustainable system. In order to provide a more complete description of Social Security's very long-run financial condition this year the Trustees present actuarial estimates over a time period that extends to the infinite horizon. These calculations show that extending the horizon indeed increases the unfunded obligation, indicating that much larger changes would be required to achieve solvency over the infinite future as compared to changes needed according to 75-year period measures.

Changes From Last Year's Report

This year's projections are little changed from those in last year's report, as shown in figure II.D6. The long-range actuarial deficit has increased from 1.87 percent to 1.92 percent of taxable payroll—primarily because the valuation period now extends through 2077. On balance, changes in assumptions, methods, and data have slightly lessened the negative impact of changing the valuation period (see table II.D2). The open group unfunded obligation over the 75-year projection period has increased from $3.3 trillion to $3.5 trillion.

Table II.D2.—Reasons for Change in the 75-Year Actuarial Balance Under Intermediate Assumptions
[As a percentage of taxable payroll]

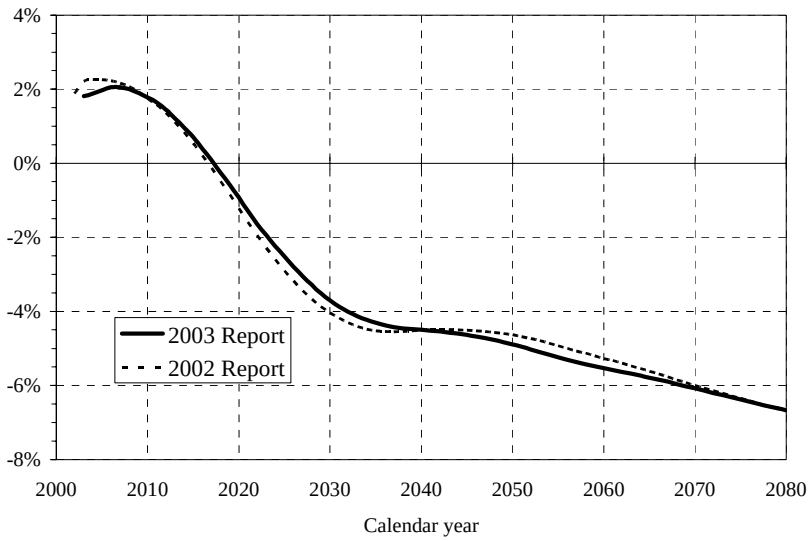
Item	OASI	DI	Combined
Shown in last year's report:			
Income rate	11.79	1.92	13.72
Cost rate	13.33	2.26	15.59
Actuarial balance	-1.54	-.34	-1.87
Changes in actuarial balance due to changes in:			
Legislation / Regulation	.00	.00	.00
Valuation period[1]	-.06	-.01	-.07
Demographic data and assumptions	-.03	-.01	-.04
Economic data and assumptions	+.01	-.01	.00
Disability data and assumptions	.00	.00	.00
Projection methods and data	+.05	+.01	+.06
Total change in actuarial balance	-.03	-.02	-.04
Shown in this report:			
Actuarial balance	-1.56	-.35	-1.92
Income rate	11.85	1.93	13.78
Cost rate	13.41	2.29	15.70

[1] In changing from the valuation period of last year's report, which was 2002-76, to the valuation period of this report, 2003-77, the relatively large negative annual balance for 2077 is included. This results in a larger long-range actuarial deficit. The fund balance at the end of 2002, i.e., at the beginning of the projection period, is included in the 75-year actuarial balance.

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

A higher assumed rate of immigration improves the projected financial situation of the trust funds in the early years, however, and delays the start of cash-flow deficits from 2017 to 2018. The year in which the combined trust funds will be exhausted also slips one year—from 2041 to 2042.

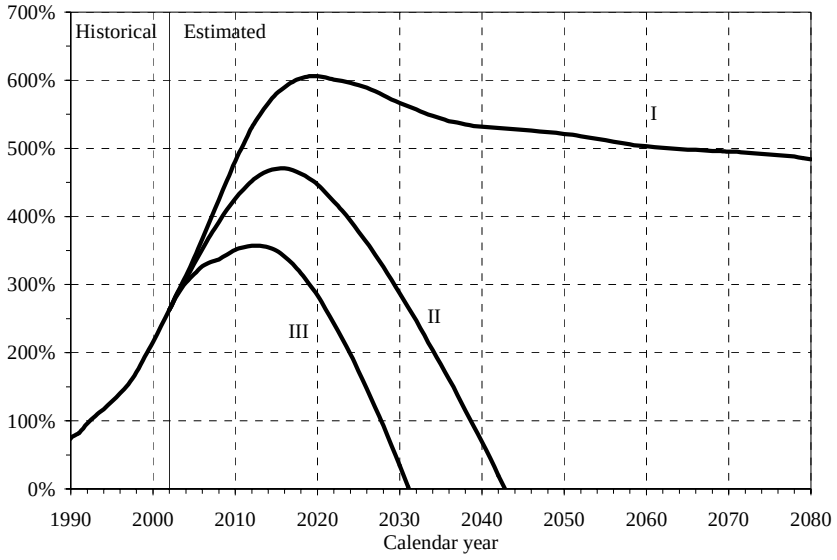
Figure II.D6.—OASDI Annual Income Less Cost as Percent of Taxable Payroll 2002 and 2003 Trustees Reports



Uncertainty of the Projections

Significant uncertainty surrounds the intermediate assumptions. The Trustees have traditionally used low cost (alternative I) and high cost (alternative III) assumptions to indicate this uncertainty. Figure II.D7 shows the projected trust fund ratios for the combined OASI and DI Trust Funds under the intermediate, low cost, and high cost assumptions. The low cost alternative is characterized by assumptions that improve the financial condition of the trust funds, including a higher fertility rate, slower improvement in mortality, a higher real-wage differential, and lower unemployment. The high cost alternative, in contrast, features a lower fertility rate, more rapid declines in mortality, a lower real-wage differential, and higher unemployment.

Figure II.D7.—Long-Range OASDI Trust Fund Ratios Under Alternative Assumptions
[Assets as a percentage of annual expenditures]



These three alternatives have traditionally been constructed to provide a reasonable range of possible future experience. However, these alternatives do not address the probability that actual experience will be within or outside the range. As an additional way of illustrating uncertainty, this Trustees Report for the first time uses a model of the trust funds that provides an explicit probability distribution of possible future outcomes (see appendix E). The results of this model suggest that outcomes better than the traditional low cost alternative and outcomes worse than the high cost alternative have very low probabilities of occurring.

E. CONCLUSION

Under current law the cost of Social Security will increase faster than the program's income, because of the aging of the baby-boom generation, expected continuing low fertility, and increasing life expectancy. Based on the Trustees' best estimates, expenditures will exceed tax revenues starting in 2018 and throughout the remainder of the 75-year projection period. Social Security's combined trust funds are projected to allow full payment of benefits until they become exhausted in 2042. At that time annual tax income to the trust funds is projected to equal about 73 percent of program costs. Separately, the OASI and DI funds are projected to have sufficient funds to pay full benefits on time until 2044 and 2028, respectively. By 2077, however, annual tax income is projected to be only about two-thirds as large as the annual cost of the OASDI program.

Over the full 75-year projection period the actuarial deficit estimated for the combined trust funds is 1.92 percent of taxable payroll—slightly higher than the 1.87 percent deficit projected in last year's report. This deficit indicates that financial adequacy of the program for the next 75 years could be restored if the Social Security payroll tax were immediately and permanently increased from its current level of 12.4 percent (for employees and employers combined) to 14.32 percent. Alternatively, all current and future benefits could be immediately reduced by about 13 percent. Other ways of reducing the deficit include making transfers from general revenues or adopting some combination of approaches.

- If no action were taken until the combined trust funds are exhausted in 2042, much larger changes would be required. For example, payroll taxes could be raised to finance scheduled benefits fully in every year starting in 2042. In this case, the payroll tax would be increased to 16.94 percent at the point of trust fund exhaustion in 2042 and continue rising to 18.9 percent in 2077.
- Similarly, benefits could be reduced in every year beginning in 2042. Under this scenario, benefits would be reduced 27 percent at the point of trust fund exhaustion in 2042, with reductions reaching 35 percent in 2077.

Changes of this magnitude would eliminate the actuarial deficit over the 75-year period through 2077. However, because of the increasing average age of the population, Social Security's annual cost will very likely continue to exceed tax revenues after 2077. As a result, ensuring the sustainability of

the system beyond 2077 would require even larger changes than those needed to restore actuarial balance for the 75-year period.

The projected trust fund deficits should be addressed in a timely way to allow for a gradual phasing in of the necessary changes and to provide advance notice to workers. The sooner adjustments are made the smaller and less abrupt they will have to be. Social Security plays a critical role in the lives of over 46 million beneficiaries, and over 150 million covered workers and their families. With informed discussion, creative thinking, and timely legislative action, we will ensure that Social Security continues to protect future generations.

III. FINANCIAL OPERATIONS OF THE TRUST FUNDS AND LEGISLATIVE CHANGES IN THE LAST YEAR

A. OPERATIONS OF THE OLD-AGE AND SURVIVORS INSURANCE (OASI) AND DISABILITY INSURANCE (DI) TRUST FUNDS, IN CALENDAR YEAR 2002

Detailed information on the operations of the OASI and DI Trust Funds[1] during calendar year 2002 is presented in this section. Section IV.A provides projections for calendar years 2003-12.

1. OASI Trust Fund

A statement of the income and disbursements of the Federal Old-Age and Survivors Insurance Trust Fund in calendar year 2002, and of the assets of the fund at the beginning and end of the calendar year, is presented in table III.A1. Included in total receipts during calendar year 2002 were $456.1 billion in employment tax contributions. These contributions were partially offset by transfers totaling $0.9 billion to the General Fund of the Treasury for the estimated amount of refunds to employees who worked for more than one employer during a year and paid contributions on total earnings in excess of the contribution and benefit base.

Taxes that were payable on estimated deemed wage credits for military service in 2000 and 2001 have not been paid in full and no partial payment was made in 2002. The amount that should have been received totals $482 million. Estimates presented later in this report do not include receipt of this total amount because it is not clear at this point whether that amount will be transferred. Although legislation eliminated deemed wage credits for military service after 2001, current law still requires payments for military service through 2001 and periodic adjustments for 1984-2001 to the extent that estimated amounts differ from actual wage credits.

Net contributions thus amounted to $455.2 billion, an increase of 3.1 percent over the amount in the preceding year. The increase in OASI tax contributions from calendar year 2001 to calendar year 2002 is due to increased earnings and the increases in the contribution and benefit base that became effective on January 1 of each year 2001 and 2002. (Table VI.A1 shows the tax rates and contribution and benefit bases in effect for past years.)

[1] Trust fund data are available by month, quarter, or year on the Internet at http://www.ssa.gov/OACT/ProgData/fundsQuery.html.

Income based on taxation of benefits amounted to $12.9 billion in 2002. Nearly 99 percent represented amounts credited to the trust funds, based on estimated Federal personal income taxation of benefits, generally in advance of the actual receipt of taxes by the Treasury. The remaining 1 percent of the total income from taxation of benefits represented amounts withheld from the benefits paid to nonresident aliens.

Table III.A1.—Operations of the OASI Trust Fund, Calendar Year 2002
[In millions]

Total assets, December 31, 2001		$1,071,540
Receipts:		
Contributions:		
Employment taxes	$456,057	
Payments from the General Fund of the Treasury for contributions subject to refund	-858	
Net contributions		455,199
Income based on taxation of benefit payments:		
Withheld from benefit payments to nonresident aliens	146	
All other, not subject to withholding	12,763	
Total income from taxation of benefits		12,909
Reimbursement from the general fund for costs of noncontributory wage credits for military service before 1957		414
Investment income and interest adjustments:		
Interest on investments	71,174	
Interest adjustments[1]	10	
Total investment income and interest adjustments		71,184
Gifts		2/
Total receipts		539,706
Disbursements:		
Benefit payments:		
Gross benefit payments	389,340	
Offset for collected overpayments	-1,170	
Reimbursement from the general fund for unnegotiated checks	-51	
Net benefit payments		388,119
Transfer to the Railroad Retirement "Social Security Equivalent Benefit Account"		3,493
Administrative expenses:		
Costs incurred by:		
Social Security Administration	1,935	
Department of the Treasury	209	
Offsetting receipts from sales of supplies, materials, etc.	-1	
Miscellaneous reimbursements from the general fund[3]	-6	
Net administrative expenses		2,137
Total disbursements		393,749
Net increase in assets		145,957
Total assets, December 31, 2002		1,217,497

[1] Includes (1) interest on transfers between the trust fund and the general fund account for the Supplemental Security Income program due to adjustments in the allocation of administrative expenses, (2) interest arising from the revised allocation of administrative expenses among the trust funds and (3) interest on reimbursements to the trust fund for costs associated with union activities and pension reform.
[2] Less than $500,000.
[3] Reimbursements for costs incurred in performing certain legislatively mandated activities not directly related to administering the OASI program.

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

The OASI Trust Fund was credited with interest netting $71.2 billion which consisted of (1) interest earned on the investments of the trust fund, (2) interest on transfers between the trust fund and the general fund account for the Supplemental Security Income program due to adjustments in the allocation of administrative expenses, (3) interest arising from the revised allocation of administrative expenses among the trust funds, and (4) interest on reimbursements to the trust fund for costs associated with union activities and pension reform. The remaining $2,222 of receipts consisted of gifts received under the provisions authorizing the deposit of money gifts or bequests in the trust funds.

Of the $393.7 billion in total disbursements, $388.1 billion was for net benefit payments. The amount of net benefit payments in calendar year 2002 represents an increase of 4.2 percent over the corresponding amount in calendar year 2001. This increase is due primarily to (1) the automatic cost-of-living benefit increase of 2.6 percent which became effective for December 2001 under the automatic-adjustment provisions in section 215(i) of the Social Security Act, (2) an increase in the total number of beneficiaries, and (3) an increase in the average benefit amount.

Provisions of the Railroad Retirement Act require an annual financial interchange between the Railroad Retirement and OASDI programs. The purpose of such provisions is to put the OASI and DI Trust Funds in the same financial position they would have been had railroad employment always been covered by Social Security. Under those provisions, the Railroad Retirement Board and the Commissioner of Social Security determined that a transfer of $3.5 billion to the Social Security Equivalent Benefit Account from the OASI Trust Fund was required in June 2002.

The remaining $2.1 billion of disbursements from the OASI Trust Fund represented net administrative expenses. The expenses of administering the OASDI and Medicare programs are allocated and charged directly to each of the various trust funds through which those programs are financed, on the basis of provisional estimates. Similarly, the expenses allocated for administering the Supplemental Security Income program are charged directly to the General Fund of the Treasury on a provisional basis. Periodically, as actual experience develops and is analyzed, adjustments to the allocations of administrative expenses for prior periods are effected by interfund transfers and transfers between the OASI Trust Fund and the general fund account for the Supplemental Security Income program, with appropriate interest adjustments. As described earlier, the interest adjustments arising from the reallocation of administrative expenses are recorded in the trust fund accounting under investment income.

The vast majority of OASI disbursements recorded as administrative expenses represent the cost of administering the program and are charged to the trust fund by the Social Security Administration ($1.9 billion in 2002). In addition, the Department of the Treasury charges directly to the trust fund certain expenses that it incurs in helping to administer the OASI program ($209 million in 2002). Finally, there are some relatively small adjustments which reduced total administrative expenses by $7 million in 2002. The first of these adjustments is an offset ($1 million in 2002) representing income from the sale of excess supplies and equipment. The second adjustment represents net reimbursements from the General Fund of the Treasury for administrative costs incurred by the Social Security Administration in performing certain legislatively mandated activities that are not directly related to the OASI program. Such reimbursements totaled $6 million in 2002.

The assets of the OASI Trust Fund at the end of calendar year 2002 totaled $1,217.5 billion, consisting of $1,217.7 billion in U.S. Government obligations and, as an offset, an extension of credit amounting to $0.2 billion against securities to be redeemed within the following few days. The effective annual rate of interest earned by the assets of the OASI Trust Fund during calendar year 2002 was 6.4 percent, as compared to 6.7 percent earned during calendar year 2001. Table III.A2 shows the total assets of the fund and their distribution at the end of each calendar year 2001 and 2002.

Table III.A2.—Assets of the OASI Trust Fund, End of Calendar Years 2001 and 2002

[In thousands]

	December 31, 2001	December 31, 2002
Obligations sold only to the trust funds (special issues):		
Certificates of indebtedness:		
4.5 percent, 2003	—	$71,454,577
5 percent, 2002	$54,987,439	—
5.125 percent, 2002	8,866,909	—
5.625 percent, 2002	677,850	—
Bonds:		
5.25 percent, 2004	—	9,235,912
5.25 percent, 2005-06	—	18,471,822
5.25 percent, 2007-15	—	83,123,208
5.25 percent, 2016	—	9,235,911
5.25 percent, 2017	—	77,387,242
5.625 percent, 2003	9,621,438	4,295,720
5.625 percent, 2004	9,621,437	9,621,437
5.625 percent, 2005-11	67,350,066	67,350,066
5.625 percent, 2012-15	38,485,748	38,485,748
5.625 percent, 2016	68,151,331	68,151,331
5.875 percent, 2002	783,303	—
5.875 percent, 2003-12	61,692,730	61,692,730
5.875 percent, 2013	43,258,869	43,258,869
6 percent, 2002	6,693,627	—
6 percent, 2003-11	60,242,643	60,242,643
6 percent, 2012-13	13,387,256	13,387,256
6 percent, 2014	49,952,497	49,952,497
6.25 percent, 2002	3,150,975	—
6.25 percent, 2003-06	12,603,900	12,603,900
6.25 percent, 2007	3,150,974	3,150,974
6.25 percent, 2008	23,350,034	23,350,034
6.5 percent, 2002	11,008,649	—
6.5 percent, 2003	11,008,649	11,008,649
6.5 percent, 2004-09	66,051,900	66,051,900
6.5 percent, 2010	38,320,240	38,320,240
6.5 percent, 2011-14	34,309,584	34,309,584
6.5 percent, 2015	58,529,893	58,529,893
6.875 percent, 2002	3,975,270	—
6.875 percent, 2003	3,975,270	3,975,270
6.875 percent, 2004-09	23,851,626	23,851,626
6.875 percent, 2010-11	7,950,544	7,950,544
6.875 percent, 2012	37,089,596	37,089,596
7 percent, 2002	3,371,481	—
7 percent, 2003	3,371,481	3,371,481
7 percent, 2004-10	23,600,360	23,600,360
7 percent, 2011	33,114,324	33,114,324
7.25 percent, 2002	3,961,556	—
7.25 percent, 2003-06	15,846,224	15,846,224
7.25 percent, 2007-08	7,923,114	7,923,114
7.25 percent, 2009	27,311,591	27,311,591
7.375 percent, 2002	3,575,474	—
7.375 percent, 2003-06	14,301,896	14,301,896
7.375 percent, 2007	20,199,060	20,199,060
8.125 percent, 2002	3,611,348	—
8.125 percent, 2003-05	10,834,044	10,834,044
8.125 percent, 2006	16,623,586	16,623,586
8.625 percent, 2002	3,672,127	—
8.75 percent, 2002	7,099,803	—
8.75 percent, 2003	7,099,803	7,099,803
8.75 percent, 2004-05	26,024,476	26,024,476
9.25 percent, 2002	2,240,308	—
9.25 percent, 2003	5,912,435	5,912,435
Total investments	1,071,794,738	1,217,701,573
Undisbursed balances[1]	-254,822	-204,383
Total assets	1,071,539,916	1,217,497,190

[1] Negative figures represent an extension of credit against securities to be redeemed within the following few days.

Note: Special issues are always purchased at par value. Therefore, book value and par value are the same for each special issue, and the common value is shown above. Where the maturity years are grouped, the amount maturing in each year is the amount shown divided by the number of years.

All securities held by the trust funds are backed by the full faith and credit of the United States Government, as required by law. Those currently held by the OASI Trust Fund are special issues (i.e., securities sold only to the trust funds). These are of two types: short-term certificates of indebtedness and long-term bonds. The certificates of indebtedness are issued on a daily basis for the investment of receipts not required to meet current expenditures, and they mature on the next June 30 following the date of issue. Special-issue bonds, on the other hand, are normally acquired only when special issues of either type mature on June 30. The amount of bonds acquired on June 30 is equal to the amount of special issues maturing, less amounts required to meet expenditures on that day.

Section 201(d) of the Social Security Act provides that the obligations issued for purchase by the OASI and DI Trust Funds shall have maturities fixed with due regard for the needs of the funds. The usual practice has been to spread the holdings of special issues, as of each June 30, so that the amounts maturing in each of the next 15 years are approximately equal. Accordingly, the amounts and maturity dates of the OASI special-issue bonds purchased on June 30, 2002, were selected so that the maturity dates of the total portfolio of special issues were spread evenly over the 15-year period 2003-17. The amount of bonds purchased on June 30, 2002 is shown in table III.A9.

2. DI Trust Fund

A statement of the income and disbursements of the Federal Disability Insurance Trust Fund in calendar year 2002, and of the assets of the fund at the beginning and end of the calendar year, is presented in table III.A3.

Line entries in the DI statement are similar to those in the OASI statement and the explanations of the OASI entries generally apply to DI as well. One additional source of disbursements in the DI statement is $75 million for the costs of vocational rehabilitation services furnished to disabled-worker beneficiaries and to those children of disabled workers who were receiving benefits on the basis of disabilities that began before age 22. Reimbursement from the trust funds for the costs of vocational rehabilitation services is made only in those cases where the services contributed to the successful rehabilitation of the beneficiaries.

Net contributions amounted to $77.3 billion, an increase of 3.1 percent from the amount in the preceding calendar year. This increase is attributable to the same factors, insofar as they apply to the DI program, that accounted for the change in contributions to the OASI Trust Fund.

Of the $67.9 billion in total disbursements, $65.6 billion was for net benefit payments. This represents an increase of 10.2 percent over the corresponding amount of benefit payments in calendar year 2001. This increase in DI benefit payments is due to the same factors that resulted in the net increase in benefit payments from the OASI Trust Fund. However, the number of persons receiving benefits from the DI Trust Fund increased more rapidly in 2002 than the number receiving benefits from the OASI Trust Fund.

Table III.A3.—Operations of the DI Trust Fund, Calendar Year 2002
[In millions]

Total assets, December 31, 2001		$140,993
Receipts:		
Contributions:		
Employment taxes	$77,424	
Payments from the General Fund of the Treasury for contributions subject to refund	-152	
Net contributions		77,272
Income based on taxation of benefit payments:		
Withheld from benefit payments to nonresident aliens	6	
All other, not subject to withholding	924	
Total income from taxation of benefits		930
Investment income and interest adjustments:		
Interest on investments	9,175	
Interest adjustments[1]	3	
Total investment income and interest adjustments		9,178
Total receipts		87,379
Disbursements:		
Benefit payments:		
Gross benefit payments	66,087	
Offset for collected overpayments	-441	
Reimbursement from the general fund for unnegotiated checks	-18	
Net benefit payments		65,627
Transfer to the Railroad Retirement "Social Security Equivalent Benefit Account"		154
Payment for costs of vocational rehabilitation services for disabled beneficiaries		75
Administrative expenses:		
Costs incurred by:		
Social Security Administration	2,014	
Department of the Treasury	39	
Miscellaneous reimbursements from the general fund[2]	-5	
Net administrative expenses		2,049
Total disbursements		67,905
Net increase in assets		19,475
Total assets, December 31, 2002		160,468

[1] Includes (1) interest on transfers between the trust fund and the general fund account for the Supplemental Security Income program due to adjustments in the allocation of administrative expenses, (2) interest arising from the revised allocation of administrative expenses among the trust funds, (3) interest earned on the investments of the trust fund, and (4) interest on reimbursements to the trust fund for costs associated with union activities and pension reform.

[2] Reimbursements for costs incurred in performing certain legislatively mandated activities not directly related to administering the DI program.

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

The assets of the DI Trust Fund at the end of calendar year 2002 totaled $160.5 billion, consisting of $160.4 billion in U.S. Government obligations and cash totaling $88 million. The effective annual rate of interest earned by the assets of the DI Trust Fund during calendar year 2002 was 6.3 percent, compared to 6.5 percent earned during calendar year 2001. Table III.A4 shows the total assets of the fund and their distribution at the end of each calendar year 2001 and 2002.

Table III.A4.—Assets of the DI Trust Fund, End of Calendar Years 2001 and 2002

[In thousands]

	December 31, 2001	December 31, 2002
Investments in public-debt obligations:		
Obligations sold only to the trust funds (special issues):		
Certificates of indebtedness:		
4.5 percent, 2003	—	$8,887,553
4.75 percent, 2003	—	89,454
5 percent, 2002	$7,948,770	—
5.125 percent, 2002	1,011,890	—
5.25 percent, 2002	275,928	—
5.625 percent, 2002	497,885	—
Bonds:		
5.25 percent, 2004-06	—	4,090,224
5.25 percent, 2007-11	—	6,817,035
5.25 percent, 2012-16	—	6,817,040
5.25 percent, 2017	—	10,263,256
5.625 percent, 2003	1,524,967	311,909
5.625 percent, 2004-06	4,574,901	4,574,901
5.625 percent, 2007-13	10,674,776	10,674,776
5.625 percent, 2014-15	3,049,934	3,049,934
5.625 percent, 2016	8,899,848	8,899,848
5.875 percent, 2002	116,192	—
5.875 percent, 2003-12	9,162,860	9,162,860
5.875 percent, 2013	5,361,805	5,361,805
6 percent, 2002	1,612,426	—
6 percent, 2003	1,437,946	1,437,946
6 percent, 2004-06	2,087,895	2,087,895
6 percent, 2007-12	4,175,796	4,175,796
6 percent, 2013	695,967	695,967
6 percent, 2014	6,057,772	6,057,772
6.5 percent, 2002	3,464,768	—
6.5 percent, 2003-06	13,859,072	13,859,072
6.5 percent, 2007	3,464,767	3,464,767
6.5 percent, 2008	4,381,228	4,381,228
6.5 percent, 2009-13	6,585,540	6,585,540
6.5 percent, 2014	1,317,109	1,317,109
6.5 percent, 2015	7,374,881	7,374,881
6.875 percent, 2002	265,249	—
6.875 percent, 2003	265,252	265,252
6.875 percent, 2004-07	1,061,000	1,061,000
6.875 percent, 2008-09	530,498	530,498
6.875 percent, 2010-12	13,336,560	13,336,560
7 percent, 2002	1,116,151	—
7 percent, 2003-08	6,696,906	6,696,906
7 percent, 2009	4,180,271	4,180,271
7.375 percent, 2004-06	142,803	142,803
7.375 percent, 2007	916,460	916,460
8.125 percent, 2004-05	300,322	300,322
8.125 percent, 2006	868,859	868,859
8.75 percent, 2003	174,477	174,477
8.75 percent, 2004-05	1,437,396	1,437,396
Total obligations sold only to the trust funds (special issues)	140,907,127	160,349,372
Public issues:		
Treasury bonds:		
7.625 percent, 2007	10,000	—
11.75 percent, 2010	30,250	30,250
Total investments in public issues at par value, as shown above	40,250	30,250
Unamortized premium or discount, net	-146	-133
Total investments in public issues at book value	40,104	30,117
Total investments in public-debt obligations (book value [1])	140,947,231	160,379,489
Undisbursed balances	45,925	88,443
Total assets (book value [1])	140,993,156	160,467,932

[1] Par value, plus unamortized premium or less discount outstanding.

Note: Special issues are always purchased at par value. Therefore, book value and par value are the same for each special issue, and the common value is shown above. Where the maturity years are grouped for special issues, the amount maturing in each year is the amount shown divided by the number of years.

3. OASI and DI Trust Funds, Combined

A statement of the operations of the income and disbursements of the OASI and DI Trust Funds, on a combined basis, is presented in table III.A5. The entries in this table represent the sums of the corresponding values from tables III.A1 and III.A3. For a discussion of the nature of these income and expenditure transactions, reference should be made to the two preceding subsections covering OASI and DI separately.

Table III.A5.—Operations of the Combined OASI and DI Trust Funds, Calendar Year 2002
[In millions]

Total assets, December 31, 2001		$1,212,533
Receipts:		
Contributions:		
Employment taxes	$533,481	
Payments from the General Fund of the Treasury for contributions subject to refund	-1,011	
Net contributions		532,471
Income based on taxation of benefit payments:		
Withheld from benefit payments to nonresident aliens	152	
All other, not subject to withholding	13,687	
Total income from taxation of benefits		13,839
Reimbursement from the general fund for costs of noncontributory wage credits for military service before 1957		414
Investment income and interest adjustments:		
Interest on investments	80,349	
Interest adjustments[1]	13	
Total investment income and interest adjustments		80,362
Gifts		2/
Total receipts		627,085
Disbursements:		
Benefit payments:		
Gross benefit payments	455,427	
Offset for collected overpayments	-1,612	
Reimbursement from the general fund for unnegotiated checks	-69	
Net benefit payments		453,746
Transfer to the Railroad Retirement "Social Security Equivalent Benefit Account"		3,647
Payment for costs of vocational rehabilitation services for disabled beneficiaries		75
Administrative expenses:		
Costs incurred by:		
Social Security Administration	3,949	
Department of the Treasury	248	
Offsetting receipts from sales of supplies, materials, etc.	-1	
Miscellaneous reimbursements from the general fund[3]	-11	
Net administrative expenses		4,185
Total disbursements		461,653
Net increase in assets		165,432
Total assets, December 31, 2002		1,377,965

[1] Includes (1) interest on transfers between the trust fund and the general fund account for the Supplemental Security Income program due to adjustments in the allocation of administrative expenses, (2) interest arising from the revised allocation of administrative expenses among the trust funds, (3) interest earned on the investments of the trust fund, and (4) interest on reimbursements to the trust fund for costs associated with union activities and pension reform.

[2] Less than $500,000.

[3] Reimbursements for costs incurred in performing certain legislatively mandated activities not directly related to administering the OASI and DI programs.

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

To provide a context for estimates of future trust fund income and expenditures provided later in this report, table III.A6 compares past estimates of contributions and benefit payments for calendar year 2002, as shown in the 1998-2002 Annual Reports, with the corresponding actual amounts in 2002.[1]

Table III.A6.—Comparison of Actual Calendar Year 2002 Trust Fund Operations With Estimates Made in Prior Reports[1]
[Amounts in billions]

	Net contributions[2]		Benefit payments[3]	
	Amount	Difference from actual (percent)	Amount	Difference from actual (percent)
OASI Trust Fund:				
Estimate in 1998 report	$426.0	-6.4	$383.2	-1.3
Estimate in 1999 report	434.9	-4.5	376.8	-2.9
Estimate in 2000 report	462.5	1.6	383.8	-1.1
Estimate in 2001 report	466.9	2.6	388.7	.1
Estimate in 2002 report	453.7	-.3	387.7	-.1
Actual amount	455.2	—	388.1	—
DI Trust Fund:				
Estimate in 1998 report	72.3	-6.4	64.1	-2.5
Estimate in 1999 report	73.8	-4.5	64.0	-2.6
Estimate in 2000 report	78.5	1.6	64.3	-2.2
Estimate in 2001 report	79.3	2.6	63.3	-3.6
Estimate in 2002 report	77.0	-.3	69.4	5.6
Actual amount	77.3	—	65.7	—
OASI and DI Trust Funds, combined:				
Estimate in 1998 report	498.4	-6.4	447.2	-1.5
Estimate in 1999 report	508.7	-4.5	440.8	-2.9
Estimate in 2000 report	541.0	1.6	448.1	-1.3
Estimate in 2001 report	546.1	2.6	452.0	-.4
Estimate in 2002 report	530.7	-.3	457.1	.7
Actual amount	532.5	—	453.8	—

[1] The estimates shown are based on the intermediate assumptions.
[2] "Actual" contributions for 2002 reflect adjustments for prior calendar years (see appendix A on page 131 for description of these adjustments). "Estimated" contributions also include such adjustments, but on an estimated basis.
[3] Includes payments, if any, for vocational rehabilitation services furnished to disabled persons receiving benefits because of their disabilities.

A number of factors can contribute to differences between estimates and subsequent actual amounts, including actual values for key demographic, economic, and other variables that differ from previously assumed levels. For example, the 2002 Trustees Report estimates of DI benefit payments for calendar year 2002 assumed that a one-time special disability workload would be processed in 2002-03, and would result in the payment of over $3 billion in retroactive benefits in 2002. In practice, as discussed later in chapter IV, very little of the special disability workload was processed in 2002, so the

[1] Estimated amounts used to calculate percentage errors are before rounding to amounts shown in the annual reports.

large retroactive payments were not made, and DI benefit payments were overestimated by that amount. Another factor contributing to such differences is new legislation. In particular, legislation eliminating the retirement earnings test for workers over the normal retirement age was enacted shortly after publication of the 2000 report. Consequently, actual OASI benefit payments in 2002 were larger than estimated for the 1998-2000 reports.

At the end of calendar year 2002, about 46.4 million persons were receiving monthly benefits under the OASDI program. Of these persons, about 39.2 million and 7.2 million were receiving monthly benefits from the OASI Trust Fund and the DI Trust Fund, respectively. The number of persons receiving benefits from the OASI and DI Trust Funds grew by 0.7 percent and 4.5 percent, respectively, during the calendar year. The estimated distribution of benefit payments in calendar years 2001 and 2002, by type of beneficiary, is shown in table III.A7 for each trust fund separately.

Table III.A7.—Distribution of Benefit Payments by Type of Beneficiary or Payment, Calendar Years 2001 and 2002
[Amounts in millions]

	Calendar year 2001		Calendar year 2002	
	Amount	Percentage of total	Amount	Percentage of total
Total OASDI benefit payments	$431,871	100.0	$453,746	100.0
OASI benefit payments	372,312	86.2	388,119	85.5
DI benefit payments	59,559	13.8	65,627	14.5
OASI benefit payments, total	372,312	100.0	388,119	100.0
Monthly benefits:				
Retired workers and auxiliaries	290,754	78.1	303,943	78.3
Retired workers	268,934	72.2	281,587	72.6
Wives and husbands	19,488	5.2	19,882	5.1
Children	2,331	.6	2,474	.6
Survivors of deceased workers	81,347	21.8	83,963	21.6
Aged widows and widowers	65,356	17.6	67,313	17.3
Disabled widows and widowers	1,392	.4	1,461	.4
Parents	26	1/	25	1/
Children	13,132	3.5	13,688	3.5
Widowed mothers and fathers caring for child beneficiaries	1,441	.4	1,476	.4
Uninsured persons generally aged 72 before 1968	2/	1/	2/	1/
Lump-sum death payments	212	.1	213	.1
DI benefit payments, total	59,559	100.0	65,627	100.0
Disabled workers	54,228	91.0	59,869	91.2
Wives and husbands	415	.7	423	.6
Children	4,916	8.3	5,335	8.1

[1] Less than 0.05 percent.
[2] Less than $500,000.

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

Net administrative expenses charged to the OASI and DI Trust Funds in calendar year 2002 totaled $4.2 billion. This amount represented 0.8 percent of contribution income and 0.9 percent of expenditures. Corresponding percentages for each trust fund separately and for the OASDI program as a whole are shown in table III.A8 for each of the last 5 years.

Table III.A8.—Administrative Expenses as a Percentage of Contribution Income and of Total Expenditures, Calendar Years 1998-2002

	OASI Trust Fund		DI Trust Fund		OASI and DI Trust Funds, combined	
Calendar year	Contribution income	Total expenditures	Contribution income	Total expenditures	Contribution income	Total expenditures
1998	0.5	0.6	2.7	3.1	0.8	0.9
1999	.5	.5	2.4	2.9	.7	.8
2000	.5	.6	2.3	2.9	.8	.9
2001	.4	.5	2.3	2.8	.7	.8
2002	.5	.5	2.7	3.0	.8	.9

Tables III.A2 and III.A4, presented earlier, showed the assets of the OASI and DI Trust Funds at the end of calendar years 2001 and 2002. The changes in the invested assets of the funds between those two dates are a result of the acquisition and disposition of securities during calendar year 2002. Table III.A9 presents these investment transactions for each trust fund separately and combined.

Table III.A9.—Trust Fund Investment Transactions, Calendar Year 2002
[In millions]

	OASI Trust Fund	DI Trust Fund	OASI and DI Trust Funds, combined
Invested assets, December 31, 2001	$1,071,795	$140,947	$1,212,742
Acquisitions:			
Special issues:			
Certificates of indebtedness	505,526	83,115	588,641
Bonds[1]	206,690	29,351	236,041
Public issues:			
Treasury bonds	—	—	—
Total acquisitions	712,216	112,466	824,682
Dispositions:			
Special issues:			
Certificates of indebtedness	498,604	83,872	582,476
Bonds	67,706	9,151	76,857
Public issues:			
Treasury bonds	—	10	10
Total dispositions	566,309	93,034	659,343
Net increase in invested assets	145,907	19,432	165,339
Invested assets, December 31, 2002	1,217,702	160,380	1,378,081

[1] Amounts shown were purchased on June 30, 2002. The interest rate on such purchases was 5.25 percent.

Note: All investments are shown at par value.

B. SOCIAL SECURITY AMENDMENTS SINCE THE 2002 REPORT

Since the 2002 Annual Report was transmitted to Congress on March 26, 2002, there have been no legislative changes enacted that would have a significant effect on the financial status of the OASDI program.

IV. ACTUARIAL ESTIMATES

This chapter presents actuarial estimates of the future financial condition of the Social Security program. These estimates include projected income and cost of the OASI and DI Trust Funds, in dollars over the next 10 years and as a percentage of taxable payroll or in present-value dollars over the full 75-year period, along with a discussion of a variety of measures of the adequacy of current program financing. In this report we are more carefully distinguishing between (1) the cost (or obligations) of the program, which includes, for the future, all benefits scheduled under current law, and (2) expenditures (disbursements or outgo), which include actual payments for the past and only the portion of the cost of the program that is projected to be payable with the financing provisions in current law.

As described in the Overview section of this report, these estimates depend upon a broad set of demographic and economic assumptions. Since these assumptions are subject to uncertainty, the estimates presented in this section are prepared under three sets of assumptions, to show a range of possible outcomes. The intermediate set of assumptions, designated as alternative II, reflects the Trustees' best estimates of future experience; the low cost alternative I is more optimistic and the high cost alternative III more pessimistic for the trust funds' future financial outlook. The intermediate estimates are shown first in the tables in this report, followed by the low cost and high cost estimates. These sets of assumptions, along with actuarial methods used to produce the estimates, are described in chapter V. In this chapter, the estimates and measures of trust fund financial adequacy for the short range (2003-12) are presented first, followed by estimates and measures of actuarial status for the long range (2003-77). As an additional illustration of uncertainty, probability distributions of certain measures are presented in appendix E. These projections are included for the first time in this year's report.

A. SHORT-RANGE ESTIMATES

In the short range, the adequacy of the trust fund level is generally measured by the "trust fund ratio," which is defined to be the assets at the beginning of the year expressed as a percentage of the projected outgo during the year. Thus, the trust fund ratio represents the proportion of a year's outgo which can be paid with the funds available at the beginning of the year. During periods when trust fund income exceeds disbursements, the excess is held in the trust funds which serve to advance fund a portion of the Social Security program's future financial obligations. During periods when trust fund disbursements exceed income, as might happen during an economic recession, trust fund assets are used to meet the shortfall. In the event of recurring shortfalls for an extended period, the trust funds can allow time for the development, enactment, and implementation of legislation to restore financial stability to the program.

The test of financial adequacy over the short-range projection period is applicable to the OASI and DI Trust Funds individually and on a combined basis. The requirements of this test are as follows: If the estimated trust fund ratio is at least 100 percent at the beginning of the projection period, then it must be projected to remain at or above 100 percent throughout the 10-year projection period. Alternatively, if the ratio is initially less than 100 percent, then it must be projected to reach a level of at least 100 percent by the beginning of the sixth year and to remain at or above 100 percent throughout the remainder of the 10-year period. In addition, the fund's estimated assets at the beginning of each month of the 10-year period must be sufficient to cover that month's disbursements. This test is applied on the basis of the intermediate estimates. Failure to meet this test by either trust fund is an indication that solvency of the program over the next 10 years is in question and that legislative action is needed to improve the short-range financial adequacy of the program.

1. Operations of the OASI Trust Fund

This subsection presents estimates of the operations and financial status of the OASI Trust Fund for the period 2003-12, based on the assumptions described in chapter V. No changes are assumed to occur in the present statutory provisions and regulations under which the OASDI program operates.[1]

These estimates are shown in table IV.A1 and indicate that the assets of the OASI Trust Fund would continue to increase rapidly throughout the next 10 years under all three sets of assumptions. Also, based on the intermediate assumptions, the assets of the OASI Trust Fund would continue to exceed 100 percent of annual expenditures by a steadily increasing amount through the end of 2012. Consequently, the OASI Trust Fund satisfies the test of short-range financial adequacy by a wide margin. The estimates in table IV.A1 also indicate that the short-range test would be satisfied even under the high cost assumptions (see figure IV.A1 for graphical illustration of these results).

The increases in estimated income shown in table IV.A1 under each set of assumptions reflect increases in estimated OASDI taxable earnings and growth in interest earnings on the invested assets of the trust fund. For each alternative, employment and earnings are assumed to increase in every year through 2012 (with the exception that employment is estimated to decline

[1] The estimates shown in this subsection reflect 12 months of benefit payments in each year of the short-range projection period. In practice, 13 benefit payments have been made in certain years, with the next year having only 11 payments. This situation resulted from the statutory requirement that benefit checks be delivered early when the normal check delivery date is a Saturday, Sunday, or legal public holiday. For example, the benefit checks for December 1998 would normally have been delivered on January 3, 1999; however, because that day was a Sunday, and the two preceding days a Saturday and a holiday, the checks were actually delivered on December 31, 1998. The annual benefit figures are shown as if those benefit checks were delivered on the usual date. Whenever this situation occurs, only the portion of benefits payable on January 3 would be delivered in December. The benefits payable later in January due to payment cycling, which began in June 1997, would still be paid in January.

slightly in 2003 under the high cost assumptions due to an assumed continuation of the economic slowdown experienced in 2001-02). The number of persons with taxable earnings would increase on the basis of alternatives I, II, and III from 153 million during calendar year 2002 to about 173 million, 169 million, and 166 million, respectively, in 2012. The total annual amount of taxable earnings is projected to increase from $4,227 billion in 2002 to $6,883 billion, $6,937 billion, and $7,262 billion, in 2012, on the basis of alternatives I, II, and III, respectively. (In constant 2002 dollars—taking account of assumed increases in the CPI from 2002 to 2012 under each alternative—the estimated amounts of taxable earnings in 2012 are $5,640 billion, $5,247 billion, and $4,789 billion, respectively.) These increases in taxable earnings are due primarily to (1) projected increases in employment levels as the working age (20-64) population increases and in average earnings in covered employment, (2) increases in the contribution and benefit base in 2003-12 under the automatic-adjustment provisions, and (3) various provisions enacted in 1983 and later, including extensions of coverage to additional categories of workers.

Growth in interest earnings represents a significant component of the overall increase in trust fund income during this period. Although interest rates payable on trust fund investments are not assumed to change substantially from current levels, the continuing rapid increase in OASI assets will result in a corresponding increase in interest income. By 2012, interest income to the OASI Trust Fund is projected to be about 21 percent of total trust fund income on the basis of the intermediate assumptions, as compared to 13.2 percent in 2002.

Figure IV.A1.—Short-Range OASI and DI Trust Fund Ratios
[Assets as a percentage of annual expenditures]

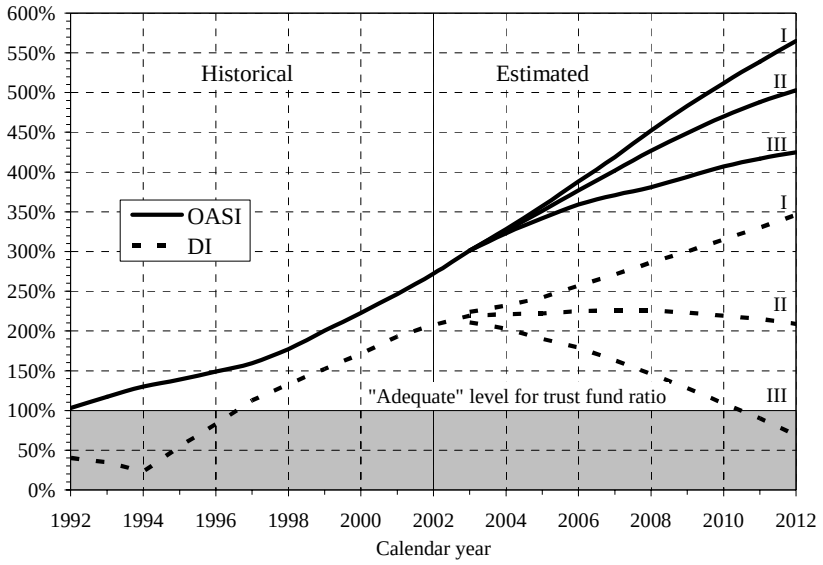


Table IV.A1.—Operations of the OASI Trust Fund, Calendar Years 1998-2012[1]
[Amounts in billions]

	Income				Cost				Assets		
Calendar year	Total[2]	Net contributions	Taxation of benefits	Net interest	Total	Benefit payments	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust fund ratio[3]
Historical data:											
1998 . .	$424.8	$371.2	$9.1	$44.5	$332.3	$326.8	$1.9	$3.7	$92.5	$681.6	177
1999 . .	457.0	396.4	10.9	49.8	339.9	334.4	1.8	3.7	117.2	798.8	201
2000 . .	490.5	421.4	11.6	57.5	358.3	352.7	2.1	3.5	132.2	931.0	223
2001 . .	518.1	441.5	11.9	64.7	377.5	372.3	2.0	3.3	140.6	1,071.5	247
2002 . .	539.7	455.2	12.9	71.2	393.7	388.1	2.1	3.5	146.0	1,217.5	272
Intermediate:											
2003 . .	552.9	463.0	12.5	77.5	404.7	398.5	2.5	3.7	148.3	1,365.8	301
2004 . .	585.0	486.0	12.6	86.4	418.8	412.6	2.5	3.7	166.2	1,531.9	326
2005 . .	625.9	514.8	13.6	97.4	436.1	429.9	2.5	3.7	189.8	1,721.7	351
2006 . .	667.5	542.9	14.4	110.1	456.4	450.4	2.5	3.5	211.1	1,932.8	377
2007 . .	713.3	573.2	15.9	124.2	480.4	474.2	2.5	3.7	232.9	2,165.7	402
2008 . .	759.2	602.8	17.4	139.0	507.7	501.5	2.5	3.7	251.6	2,417.3	427
2009 . .	807.0	633.6	19.0	154.5	537.9	531.7	2.5	3.7	269.1	2,686.4	449
2010 . .	856.8	665.2	20.8	170.7	571.8	565.5	2.5	3.7	285.0	2,971.4	470
2011 . .	910.2	698.1	24.3	187.8	609.2	603.0	2.6	3.6	301.0	3,272.4	488
2012 . .	963.6	731.2	26.6	205.7	650.3	643.8	2.6	3.9	313.3	3,585.7	503
Low Cost:											
2003 . .	555.4	465.1	12.5	77.9	404.6	398.5	2.5	3.7	150.8	1,368.3	301
2004 . .	593.1	493.3	12.5	87.2	417.7	411.5	2.5	3.6	175.4	1,543.7	328
2005 . .	631.6	520.5	13.5	97.6	432.8	426.6	2.5	3.7	198.8	1,742.5	357
2006 . .	670.4	547.2	14.2	109.0	449.2	443.2	2.4	3.5	221.2	1,963.7	388
2007 . .	712.8	576.0	15.5	121.4	468.1	462.1	2.4	3.6	244.7	2,208.4	419
2008 . .	756.1	604.3	16.8	135.0	489.1	483.1	2.4	3.6	267.1	2,475.4	452
2009 . .	801.6	633.6	18.1	149.9	513.0	507.0	2.4	3.5	288.7	2,764.1	483
2010 . .	849.3	663.7	19.6	165.9	539.9	533.9	2.5	3.5	309.4	3,073.5	512
2011 . .	900.7	694.6	22.7	183.3	569.7	563.9	2.5	3.3	331.0	3,404.5	539
2012 . .	952.0	725.6	24.7	201.7	602.7	596.6	2.5	3.6	349.3	3,753.8	565
High Cost:											
2003 . .	547.4	458.5	12.5	76.4	405.0	398.9	2.5	3.7	142.4	1,359.9	301
2004 . .	571.6	473.5	12.6	85.4	420.9	414.7	2.5	3.7	150.7	1,510.6	323
2005 . .	626.1	512.3	13.8	100.0	441.8	435.6	2.5	3.7	184.3	1,694.9	342
2006 . .	671.6	539.3	14.9	117.4	471.7	465.6	2.5	3.6	200.0	1,894.9	359
2007 . .	724.3	572.2	16.9	135.2	511.4	505.0	2.5	3.8	212.8	2,107.7	371
2008 . .	793.6	617.6	19.0	157.1	553.4	546.8	2.6	4.0	240.2	2,347.9	381
2009 . .	850.5	655.5	21.0	174.0	596.4	589.6	2.7	4.1	254.2	2,602.0	394
2010 . .	903.8	691.8	23.3	188.8	639.8	632.9	2.7	4.3	264.0	2,866.0	407
2011 . .	959.7	728.2	27.4	204.1	687.0	680.0	2.8	4.3	272.6	3,138.7	417
2012 . .	1,015.2	765.3	30.3	219.6	739.2	731.8	2.8	4.6	276.0	3,414.6	425

[1] A detailed description of the components of income and cost, along with complete historical values, is presented in appendix A.

[2] "Total Income" column includes transfers made between the OASI Trust Fund and the General Fund of the Treasury that are not included in the separate components of income shown. These transfers consist of payments for (1) the cost of noncontributory wage credits for military service before 1957, and (2) the cost of benefits to certain uninsured persons who attained age 72 before 1968. (For example, a $414 million transfer was made in February 2002 from the General Fund of the Treasury to the OASI Trust Fund for the cost of pre-1957 military service wage credits.) Such transfers are estimated to be less than $500,000 in each year of the projection period.

[3] The "Trust fund ratio" column represents assets at the beginning of a year (which are identical to assets at the end of the prior year shown in the "Amount at end of year" column) as a percentage of cost for the year. See text beginning on page 36 concerning interpretation of these ratios.

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

Rising expenditures during 2003-12 reflect automatic benefit increases as well as the upward trend in the number of beneficiaries and in the average monthly earnings underlying benefits payable by the program. The growth in the number of beneficiaries in the past and the expected growth in the future result both from the increase in the aged population and from the increase in the proportion of the population which is eligible for benefits.

Growth has also occurred, and will continue to occur, in the proportion of eligible persons who receive benefits. This growth is due to several factors, including (1) the amendments enacted since 1950 which affect the conditions governing the receipt of benefits and (2) the increasing percentage of eligible persons who have attained normal retirement age and who therefore may receive benefits regardless of earnings.

The estimates under all three sets of assumptions shown in table IV.A1 indicate that income to the OASI Trust Fund would substantially exceed expenditures in every year of the short-range projection period, and assets are therefore estimated to increase substantially.

The portion of the OASI Trust Fund that is not needed to meet day-to-day expenditures is used to purchase investments, generally in special public-debt obligations of the U.S. Government. The cash used to make these purchases becomes part of the General Fund of the Treasury and can be used to meet various Federal outlays or to reduce the amount of publicly-held Federal debt. Interest is paid to the trust fund on these securities and, when the securities mature or are redeemed prior to maturity, general fund revenues are used to repay the principal to the trust fund. Thus, the investment operations of the trust fund result in various cash flows between the trust fund and the General Fund of the Treasury.

Currently, the excess of tax income to the OASI Trust Fund over the fund's expenditures is borrowed by the general fund, resulting in a substantial net cash flow to the general fund. As discussed in the following section on page 54, this cash flow will reverse sometime in the next 10-20 years; as increasingly larger amounts of annual interest income are used in that period to meet benefit payments and other expenditures, revenue from the General Fund of the Treasury will be drawn upon to provide the necessary cash. The accumulation and subsequent redemption of substantial trust fund assets has important public policy and economic implications that extend well beyond the operation of the OASDI program itself.

In interpreting the trust fund ratios in table IV.A1, it should be noted that at the beginning of any month there must be sufficient assets on hand to meet the benefit payments that are payable at the beginning of that month. The specific minimum amount of assets required for this purpose depends on a number of factors and varies somewhat from month to month. Currently, assets of roughly 6 to 7 percent of annual expenditures are sufficient for this

purpose, although this minimum requirement will decline very gradually in the future as cycling of payments throughout the month phases in and replaces payment of most benefits on the third of the month. If the assets of either the OASI or DI Trust Fund at the end of a month fall below the minimum amount needed to meet the benefits payable at the beginning of the next month, section 201(a) of the Social Security Act provides for an advance transfer to the trust fund of all the taxes that are expected to be received by the fund in the next month. Thus, the difference between (1) the sum of the estimated trust fund ratios shown in table IV.A1 and the advance tax transfers for January expressed as a percentage of total cost in the year and (2) the minimum level required to pay benefits on time, represents the reserve available to handle adverse contingencies.

2. Operations of the DI Trust Fund

The estimated operations and financial status of the DI Trust Fund during calendar years 2003-12 under the three sets of assumptions are shown in table IV.A2, together with figures on actual experience in 1998-2002. Income is generally projected to increase steadily under each alternative, reflecting most of the same factors described previously in connection with the OASI Trust Fund. The estimates indicate that the assets of the DI Trust Fund would also continue to increase throughout the next 10 years under the intermediate and low cost assumptions, but at a lower rate than for the OASI Trust Fund. Under the high cost assumptions, DI assets would increase through the middle of 2007 and decline steadily thereafter.

Expenditures are estimated to increase because of automatic benefit increases and projected increases in the amounts of average monthly earnings on which benefits are based. In addition, under all three sets of assumptions, the number of DI beneficiaries in current-payment status is projected to continue increasing throughout the short-range projection period. Over the period 2002-12, the projected annual average growth rate in the number of DI worker beneficiaries is roughly 2.0, 3.3, and 4.7 percent under alternatives I, II, and III, respectively. Growth is largely attributable to the gradual progression of the baby-boom generation through ages 50-65 at which higher rates of disability incidence are experienced.

The proportion of insured workers who are awarded disability benefits in a given year is referred to as the disability incidence rate. Due to the substantial variation exhibited by incidence rates in the past and the difficulty in determining reliable explanatory factors for this variation, any projection of future incidence rates necessarily will be uncertain. The 2002 disability incidence rate (calculated on an age-sex-adjusted basis) was 5.24 awards per thousand insured workers. This figure was almost 7 percent higher than the average incidence rate of 4.91 per thousand that was experienced during the period 1975-2001. The 2002 rate represented a 6 percent increase over the

corresponding value for 2001, and follows an 8 percent increase from 2000 to 2001. These sharp annual increases over the period 2000-02 represent a dramatic departure from the experience of the preceding 8 years which generally observed modest annual declines in the age-sex-adjusted disability incidence rate.

The increases in the incidence rates in 2001 and 2002 are likely due in large part to the economic downturn experienced during that period. However, as was first discussed in the 2002 report, a special administrative activity undertaken by SSA beginning in 2001 also contributed slightly to the upsurge in disabled worker awards. This special workload was the result of discovering a large number of current or former recipients of Supplemental Security Income (SSI) benefits whose disability-insured status under the DI program was not previously recognized. As this special disability workload is processed over the next several years, the resulting disability awards will contribute to higher incidence rates than would have been expected as part of longer term underlying trends.

Estimates for the size of this special workload, and the time required to process the claims, have been revised substantially since the 2002 report. However, after the special workload cases are processed, the incidence rates projected in this report over the short range are expected to return to levels roughly in line with those assumed in last year's report. Under the intermediate assumptions, age-sex-adjusted incidence rates are assumed to continue at the 5.2 per thousand level in 2003 and then decline to 4.8 per thousand by 2007 and remain at roughly that level for the remainder of the short-range projection period, slightly below the average level for the past 25 years. Under the high cost alternative, incidence rates are assumed to increase temporarily in 2003, and then decline beginning in 2004, reaching a level of 5.6 per thousand by the end of the short-range period. Under the low cost alternative, incidence rates are estimated to decline from current levels to roughly 4 per thousand by the end of the short-range period.

Table IV.A2.—Operations of the DI Trust Fund, Calendar Years 1998-2012[1]
[Amounts in billions]

	Income				Cost				Assets		
Calendar year	Total[2]	Net contri-butions	Taxa-tion of benefits	Net inter-est	Total	Benefit pay-ments	Admin-istra-tive costs	RRB inter-change	Net increase during year	Amount at end of year	Trust fund ratio[3]
Historical data:											
1998 . .	$64.4	$59.0	$0.6	$4.8	$49.9	$48.2	$1.6	$0.2	$14.4	$80.8	133
1999 . .	69.5	63.2	.7	5.7	53.0	51.4	1.5	.1	16.5	97.3	152
2000 . .	77.9	71.1	.7	6.9	56.8	55.0	1.6	.2	21.1	118.5	171
2001 . .	83.9	74.9	.8	8.2	61.4	59.6	1.7	[4]	22.5	141.0	193
2002 . .	87.4	77.3	.9	9.2	67.9	65.7	2.0	.2	19.5	160.5	208
Intermediate:											
2003 . .	89.6	78.6	.9	10.0	73.2	71.2	1.9	.2	16.3	176.8	219
2004 . .	94.4	82.5	1.0	10.9	80.0	77.8	2.0	.2	14.4	191.2	221
2005 . .	100.4	87.4	1.1	11.8	86.3	84.0	2.1	.3	14.1	205.3	222
2006 . .	106.2	92.2	1.2	12.8	91.2	88.8	2.2	.3	15.0	220.2	225
2007 . .	112.5	97.3	1.3	13.8	97.5	94.8	2.3	.3	15.0	235.2	226
2008 . .	118.6	102.4	1.5	14.7	104.2	101.4	2.5	.3	14.4	249.6	226
2009 . .	124.8	107.6	1.7	15.5	112.0	109.1	2.6	.3	12.8	262.4	223
2010 . .	131.1	113.0	1.9	16.2	119.6	116.5	2.8	.4	11.5	273.9	219
2011 . .	137.7	118.5	2.3	16.8	127.6	124.3	2.9	.4	10.0	283.9	215
2012 . .	144.1	124.2	2.6	17.4	135.7	132.3	3.1	.4	8.4	292.3	209
Low Cost:											
2003 . .	90.0	79.0	.9	10.1	71.6	69.6	1.9	.2	18.3	178.8	224
2004 . .	95.9	83.8	.9	11.2	76.9	74.7	2.0	.2	19.0	197.8	232
2005 . .	101.8	88.4	1.0	12.3	81.6	79.2	2.1	.3	20.2	218.0	242
2006 . .	107.6	92.9	1.1	13.5	84.7	82.2	2.2	.3	22.9	240.9	257
2007 . .	113.8	97.8	1.2	14.8	88.8	86.2	2.3	.3	25.1	266.0	271
2008 . .	120.2	102.6	1.3	16.2	92.9	90.2	2.4	.3	27.2	293.2	286
2009 . .	126.8	107.6	1.5	17.7	97.8	95.0	2.5	.3	28.9	322.1	300
2010 . .	133.6	112.7	1.6	19.3	102.3	99.4	2.7	.3	31.3	353.4	315
2011 . .	140.9	118.0	1.9	21.0	107.1	104.0	2.8	.3	33.8	387.2	330
2012 . .	148.3	123.2	2.1	22.9	111.8	108.6	3.0	.3	36.4	423.6	346
High Cost:											
2003 . .	88.6	77.9	1.0	9.8	76.2	74.1	1.9	.2	12.4	172.9	211
2004 . .	91.9	80.4	1.1	10.4	85.3	83.0	2.0	.2	6.5	179.5	203
2005 . .	99.3	87.0	1.2	11.1	94.3	92.0	2.1	.3	5.0	184.4	190
2006 . .	104.6	91.6	1.4	11.7	102.7	100.2	2.2	.3	1.9	186.3	179
2007 . .	110.5	97.2	1.6	11.8	114.0	111.3	2.4	.3	-3.5	182.8	163
2008 . .	118.4	104.9	1.8	11.7	125.6	122.6	2.6	.4	-7.2	175.6	146
2009 . .	124.5	111.3	2.1	11.1	137.7	134.5	2.8	.4	-13.2	162.5	128
2010 . .	130.0	117.5	2.4	10.1	148.7	145.3	3.0	.4	-18.7	143.8	109
2011 . .	135.4	123.7	2.9	8.9	160.3	156.7	3.1	.4	-24.8	118.9	90
2012 . .	140.5	130.0	3.3	7.2	172.1	168.3	3.3	.5	-31.6	87.3	69

[1] A detailed description of the components of income and cost is presented in appendix A.

[2] "Total Income" column includes transfers made between the DI Trust Fund and the General Fund of the Treasury that are not included in the separate components of income shown. These transfers consist of payments for the cost of noncontributory wage credits for military service before 1957. (For example, an $836 million transfer was made in December 2000 from the DI Trust Fund to the General Fund of the Treasury for the cost of pre-1957 military service wage credits.) Such transfers are estimated to be less than $500,000 in each year of the projection period.

[3] The "Trust fund ratio" column represents assets at the beginning of a year (which are identical to assets at the end of the prior year shown in the "Amount at end of year" column) as a percentage of cost for the year. See text beginning on page 36 concerning interpretation of these ratios.

[4] Less than $50 million.

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

The proportion of DI beneficiaries whose benefits terminate in a given year has also fluctuated significantly in the past. Over the last 20 years, the rates of benefit termination due to death or conversion to retirement benefits (at attainment of normal retirement age) have declined very gradually. This trend is attributable, in part, to the lower average age of new beneficiaries. However, some recent program changes and health trends have also led to improved mortality experience among the DI disabled workers. These changes include legislation to exclude drug addicts and alcoholics from the DI rolls; the diminished impact of AIDS on DI; continued increases in mental-impairment disabilities; and a rising number of awards to older workers, which are based on vocational factors. The termination rate due to recovery has been much more volatile. Currently, the proportion of disabled beneficiaries whose benefits cease because of their recovery from disability is very low in comparison to levels experienced throughout the 1970s and early 1980s.

In this report, termination rates due to attainment of normal retirement age are estimated to drop in 2003, from the level of roughly 40 per thousand disabled experienced over the past several years to 33-34 per thousand, and remain at that lower level for 5 more years as a result of the increase in the normal retirement age. Age-specific death rates for disabled beneficiaries are assumed to decline gradually from the current experience levels. Projected levels of recovery terminations for this year's report remain consistent with last year's report after adjusting for 2002 actual experience. The overall termination rate (reflecting all causes) is projected to decline in 2003 due largely to the increase in the normal retirement age cited above.

At the beginning of calendar year 2002, the assets of the DI Trust Fund represented 208 percent of annual expenditures. During 2002, DI income exceeded DI expenditures by $19.5 billion, contributing to an increase in the trust fund ratio for the beginning of 2003 to about 219 percent. Under the intermediate set of assumptions, total income is estimated to exceed expenditures in each year of the short-range projection period. However, the projected decline in the trust fund ratio from a peak of 226 percent in 2007 to 209 percent by the beginning of 2012 is an early warning of the eventual shortfall in available DI Trust Fund assets needed to cover program cost—projected under the intermediate assumptions to occur after the end of the short-range period.

Under the low cost assumptions, the trust fund ratio would increase rapidly to 346 percent at the beginning of 2012. Under the high cost assumptions, the assets of the DI Trust Fund would increase through 2003 and then decline steadily thereafter, dipping below the level of 1 year's expenditures near the middle of 2010.

Because DI assets were greater than 1 year's expenditures at the beginning of 2003 and would remain above that level in 2004 and later the DI Trust Fund satisfies the Trustees' short-range test of financial adequacy under both the intermediate and low cost assumptions. However, under the high cost assumptions the DI Trust Fund fails to meet the short-range test of financial adequacy, because assets fall below 1 year's expenditures by the end of the short-range period, as described above (see also figure IV.A1).

3. Operations of the Combined OASI and DI Trust Funds

The estimated operations and status of the OASI and DI Trust Funds, combined, during calendar years 2003-12 on the basis of the three alternatives, are shown in table IV.A3, together with figures on actual experience in 1998-2002. The dollar amounts are the sums of the corresponding figures shown in tables IV.A1 and IV.A2. Since the income and cost for the OASI Trust Fund represent over 80 percent of the corresponding amounts for the combined OASI and DI Trust Funds, the operations of the OASI Trust Fund dominate the operations of the combined two funds. Consequently, the combined OASI and DI Trust Funds meet the requirements of the short-range test of financial adequacy under all three alternative sets of assumptions.

Table IV.A3.—Operations of the Combined OASI and DI Trust Funds, Calendar Years 1998-2012[1]
[Amounts in billions]

	Income				Cost				Assets		
Calendar year	Total[2]	Net contributions	Taxation of benefits	Net interest	Total	Benefit payments	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust fund ratio[3]
Historical data:											
1998 . .	$489.2	$430.2	$9.7	$49.3	$382.3	$375.0	$3.5	$3.8	$107.0	$762.5	171
1999 . .	526.6	459.6	11.6	55.5	392.9	385.8	3.3	3.8	133.7	896.1	194
2000 . .	568.4	492.5	12.3	64.5	415.1	407.6	3.8	3.7	153.3	1,049.4	216
2001 . .	602.0	516.4	12.7	72.9	438.9	431.9	3.7	3.3	163.1	1,212.5	239
2002 . .	627.1	532.5	13.8	80.4	461.7	453.8	4.2	3.6	165.4	1,378.0	263
Intermediate:											
2003 . .	642.5	541.6	13.4	87.5	477.9	469.7	4.3	3.9	164.6	1,542.6	288
2004 . .	679.4	568.5	13.6	97.3	498.8	490.4	4.5	3.9	180.6	1,723.1	309
2005 . .	726.2	602.2	14.7	109.3	522.4	513.8	4.6	3.9	203.8	1,927.0	330
2006 . .	773.7	635.1	15.6	122.9	547.6	539.2	4.7	3.8	226.1	2,153.0	352
2007 . .	825.7	670.6	17.2	137.9	577.8	569.1	4.8	4.0	247.9	2,400.9	373
2008 . .	877.8	705.2	18.9	153.7	611.8	602.9	4.9	4.0	266.0	2,666.9	392
2009 . .	931.8	741.2	20.7	170.0	649.9	640.8	5.1	4.0	281.9	2,948.8	410
2010 . .	987.9	778.2	22.7	186.9	691.4	682.0	5.3	4.1	296.5	3,245.2	426
2011 . .	1,047.9	816.6	26.6	204.6	736.8	727.3	5.5	4.0	311.1	3,556.3	440
2012 . .	1,107.7	855.4	29.2	223.1	786.0	776.1	5.7	4.3	321.7	3,878.0	452

Table IV.A3.—Operations of the Combined OASI and DI Trust Funds, Calendar Years 1998-2012[1] (Cont.)
[Amounts in billions]

	Income				Cost				Assets		
Calendar year	Total[2]	Net contributions	Taxation of benefits	Net interest	Total	Benefit payments	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust fund ratio[3]
Low Cost:											
2003 . .	$645.4	$544.1	$13.4	$88.0	$476.3	$468.0	$4.3	$3.9	$169.2	$1,547.1	289
2004 . .	689.0	577.1	13.5	98.5	494.6	486.2	4.5	3.9	194.4	1,741.5	313
2005 . .	733.4	608.9	14.5	110.0	514.4	505.9	4.6	3.9	219.0	1,960.5	339
2006 . .	778.0	640.2	15.3	122.5	533.8	525.5	4.6	3.7	244.1	2,204.6	367
2007 . .	826.6	673.8	16.7	136.2	556.9	548.2	4.7	3.9	269.7	2,474.4	396
2008 . .	876.3	707.0	18.1	151.2	582.0	573.3	4.8	3.9	294.3	2,768.6	425
2009 . .	928.4	741.2	19.6	167.6	610.8	602.0	5.0	3.8	317.6	3,086.2	453
2010 . .	982.9	776.4	21.3	185.2	642.2	633.3	5.1	3.8	340.7	3,426.9	481
2011 . .	1,041.6	812.6	24.6	204.3	676.8	667.9	5.3	3.7	364.8	3,791.7	506
2012 . .	1,100.3	848.8	26.8	224.6	714.5	705.2	5.4	3.9	385.7	4,177.4	531
High Cost:											
2003 . .	636.0	536.3	13.4	86.3	481.2	473.0	4.3	3.9	154.8	1,532.8	286
2004 . .	663.5	553.9	13.7	95.8	506.2	497.8	4.5	3.9	157.3	1,690.1	303
2005 . .	725.4	599.3	15.0	111.1	536.1	527.6	4.6	4.0	189.2	1,879.3	315
2006 . .	776.2	630.9	16.3	129.1	574.4	565.8	4.7	3.8	201.8	2,081.1	327
2007 . .	834.8	669.3	18.5	147.0	625.5	616.3	5.0	4.2	209.4	2,290.5	333
2008 . .	912.0	722.4	20.8	168.8	679.0	669.4	5.2	4.3	233.0	2,523.5	337
2009 . .	975.0	766.8	23.1	185.1	734.0	724.1	5.5	4.5	241.0	2,764.5	344
2010 . .	1,033.9	809.3	25.7	198.9	788.6	778.2	5.7	4.7	245.3	3,009.8	351
2011 . .	1,095.1	851.9	30.3	212.9	847.3	836.7	5.9	4.7	247.8	3,257.6	355
2012 . .	1,155.7	895.3	33.6	226.8	911.3	900.1	6.1	5.1	244.4	3,502.0	357

[1] A detailed description of the components of income and cost is presented in appendix A.
[2] "Total Income" column includes transfers made between the OASI and DI Trust Funds and the General Fund of the Treasury that are not included in the separate components of income shown. These transfers consist of payments for (1) the cost of noncontributory wage credits for military service before 1957, and (2) the cost of benefits to certain uninsured persons who attained age 72 before 1968. Such transfers are estimated to be less than $500,000 in each year of the projection period.
[3] The "Trust fund ratio" column represents assets at the beginning of a year (which are identical to assets at the end of the prior year shown in the "Amount at end of year" column) as a percentage of cost for the year. See text beginning on page 36 concerning interpretation of these ratios.

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

4. Factors Underlying Changes in 10-Year Trust Fund Ratio Estimates From the 2002 Report

The factors underlying the changes in the intermediate estimates for the OASI, DI and the combined funds from last year's annual report to this report are analyzed in table IV.A4. In the 2002 Annual Report, the trust fund ratio for OASI was estimated to reach 491 percent at the beginning of 2011—the tenth projection year from that report. If there had been no changes to the projections, the estimated ratio at the beginning of 2012 would be 14 percentage points higher than at the beginning of 2011, or 505 percent. There were changes, however, to reflect the latest actual data, as well as adjustments to the assumptions for future years. The resulting ratio shown in this report for the tenth projection year (2012) is 503 percent. Higher estimates of the population over the short-range period resulted in an estimated small net reduction in the tenth-year trust fund ratio. The cumula-

tive net effects of changes in economic data and assumptions (including re-estimates of future tax revenue consistent with recent revisions to historical data) resulted in a reduction in the trust fund ratio of 30 percentage points by the beginning of 2012. Roughly offsetting this economic effect over the short-range was the net effect of various factors labeled collectively as "programmatic data and assumptions." For OASI, the most significant factor contributing to this change was a revised assessment of the impact of the increasing normal retirement age on retirement patterns of old-age beneficiaries over the next 10 years.

Corresponding estimates of the factors underlying the changes in the financial projections for the DI Trust Fund, and for the OASI and DI Trust Funds combined, are also shown in table IV.A4. Other than the effect of the revised economic assumptions, the key factor affecting the new trust fund ratio estimates for the DI Trust Fund was the change in the projected number of beneficiaries described earlier.

Table IV.A4.—Reasons for Change in Trust Fund Ratios at the Beginning of the Tenth Year of Projection
[In percent]

Item	OASI Trust Fund	DI Trust Fund	OASI and DI Trust Funds, combined
Trust fund ratio shown in last year's report for calendar year 2011	491	235	447
Change in trust fund ratio due to changes in:			
Legislation	—	—	—
Valuation period	14	-5	10
Demographic data and assumptions	-2	-4	-2
Economic data and assumptions	-30	-25	-29
Programmatic data and assumptions	30	9	25
Total change in trust fund ratio	12	-26	5
Trust fund ratio shown in this report for calendar year 2012	503	209	452

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

B. LONG-RANGE ESTIMATES

Three types of financial measures are useful in assessing the actuarial status of the Social Security trust funds under the financing approach specified in current law: (1) annual cash-flow measures, including income and cost rates, and balances, (2) trust fund ratios, and (3) summary measures like actuarial balance and unfunded obligations. The first long-range estimates presented are the series of projected annual balances, which are the differences between the projected annual income rates and annual cost rates. In assessing the financial condition of the program, particular attention should be paid to the level of the annual balances at the end of the long-range period and the time at which the annual balances may change from positive to negative values. The next measure discussed is the pattern of projected trust fund ratios. The trust fund ratio represents the proportion of a year's projected outgo that can be paid with the funds available at the beginning of the year. Particular attention should be paid to the amount and year of maximum trust fund ratio, to the year of exhaustion of the funds, and to stability of the trust fund ratio in cases where the ratio remains positive at the end of the long-range period. The final measures discussed in this section summarize the total income and cost over valuation periods that extend through 75 years, and the infinite horizon. These measures indicate whether projected income will be adequate for the period as a whole. Estimates for the infinite future were not included in last year's report, but are included in this year's report. The first such measure, actuarial balance, indicates the size of any shortfall as a percentage of the taxable payroll over the period. The second, open group unfunded obligation, indicates the size of any shortfall in present-value discounted dollars. This section also includes a comparison of workers to beneficiaries, closed group unfunded obligations, the long-range test of close actuarial balance, and the reasons for change in the actuarial balance from the last report.

If the 75-year actuarial balance is zero (or positive) then the trust fund ratio at the end of the period, by definition, will be at 100 percent (or greater) and financing for the program is considered to be adequate for the 75-year period as a whole. (Financial adequacy for each year is determined by whether the trust fund is zero or positive throughout the year.) Whether or not financial adequacy is stable in the sense that it is likely to continue for subsequent 75-year periods in succeeding reports is also important when considering the actuarial status of the program. One indication of this stability is the behavior of the trust fund ratio at the end of the projection period. If projected trust fund ratios for the last several years of the long-range period are positive and constant or rising, then it is likely that subsequent Trustees Reports will also show projections of financial adequacy (assuming no changes in demographic and economic assumptions). The actuarial balance and the open

group unfunded obligation for the infinite future provide additional measures of the ultimate financial status of the program.

1. Annual Income Rates, Cost Rates, and Balances

Basic to the consideration of the long-range actuarial status of the trust funds are the concepts of income rate and cost rate, each of which is expressed as a percentage of taxable payroll. Other measures of the cash flow of the program are shown in appendix F. The annual income rate is the ratio of income from revenues (payroll tax contributions and income from the taxation of benefits) to the OASDI taxable payroll for the year. The OASDI taxable payroll consists of the total earnings which are subject to OASDI taxes, with some relatively small adjustments.[1] Because the taxable payroll reflects these adjustments, the annual income rate can be defined to be the sum of the OASDI combined employee-employer contribution rate (or the payroll-tax rate) scheduled in the law and the rate of income from taxation of benefits (which is, in turn, expressed as a percentage of taxable payroll). As such, it excludes net investment income and reimbursements from the General Fund of the Treasury for the costs associated with special monthly payments to certain uninsured persons who attained age 72 before 1968 and who have fewer than 3 quarters of coverage.

The annual cost rate is the ratio of the cost of the program to the taxable payroll for the year. In this context, the cost is defined to include scheduled benefit payments, special monthly payments to certain uninsured persons who have 3 or more quarters of coverage (and whose payments are therefore not reimbursable from the General Fund of the Treasury), administrative expenses, net transfers from the trust funds to the Railroad Retirement program under the financial-interchange provisions, and payments for vocational rehabilitation services for disabled beneficiaries. For any year, the income rate minus the cost rate is referred to as the balance for the year. (In this context, the term balance does not represent the assets of the trust funds, which are sometimes referred to as the balance in the trust funds.)

Table IV.B1 presents a comparison of the estimated annual income rates and cost rates by trust fund and alternative. Detailed long-range projections of trust fund operations, in nominal dollar amounts, are shown in table VI.F9.

The projections for OASI under the intermediate assumptions show the income rate increasing slowly and steadily due to the combination of the flat

[1] Adjustments are made to include deemed wage credits based on military service for 1983-2001, and to reflect the lower effective 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 income from tips.

payroll tax rate and the gradually increasing effect of the taxation of benefits. The pattern of the cost rate is much different. It is projected to remain fairly stable for the next several years. However, from about 2010 to 2030 the cost rate increases rapidly as the baby-boom generation reaches retirement age. Thereafter, the cost rate rises steadily, but slowly, reflecting projected reductions in death rates and continued relatively low birth rates, reaching 17.27 percent of taxable payroll for 2077. By comparison, the income rate reaches 11.54 percent of taxable payroll for 2077.

Projected income rates under the low cost and high cost sets of assumptions are very similar to those projected for the intermediate assumptions as they are largely a reflection of the tax rates specified in the law. OASI cost rates for the low cost and high cost assumptions differ significantly from those projected for the intermediate assumptions, but follow generally similar patterns. For the low cost assumptions, the cost rate declines somewhat for the first 5 years, and then rises, reaching the current level around 2014 and a peak of 13.06 percent of payroll for 2035. The cost rate then declines gradually, reaching a level of 12.44 percent of payroll for 2077. For the high cost assumptions, the cost rate rises generally throughout the 75-year period. It rises at a relatively fast pace between 2010 and 2030 because of the aging of the baby-boom generation. During the third 25-year subperiod, the projected cost rate continues rising and reaches 24.87 percent of payroll for 2077.

The projected pattern of the OASI annual balance is important in the analysis of the financial condition of the program. Under the intermediate assumptions the annual balance is positive for 15 years (through 2017) and is negative thereafter. This annual deficit rises rapidly, reaching over 2 percent of taxable payroll by 2025, and continues rising thereafter, to a level of 5.73 percent of taxable payroll for 2077.

Under the low cost assumptions the projected OASI annual balance is positive for 19 years (through 2021) and thereafter is negative. The deficit under the low cost assumptions rises to a peak of 1.81 percent of taxable payroll for 2035, but declines over the next 15 to 20 years, as the effect of the baby-boom generation diminishes and the assumed higher fertility rates increase the size of the work force. The deficit under the low cost assumptions continues to decline, but at a relatively slow pace over the period 2051 through 2077. Under the high cost assumptions, however, the OASI balance is projected to be positive for only 12 years (through 2014) and to be negative thereafter, with a deficit of 1.80 percent for 2020, 7.94 percent for 2050, and 12.91 percent of payroll for 2077.

Table IV.B1.—Estimated Annual Income Rates, Cost Rates, and Balances
Calendar Years 1990-2080
[As a percentage of taxable payroll]

Calendar year	OASI Income rate[1]	OASI Cost rate	OASI Balance[2]	DI Income rate[1]	DI Cost rate	DI Balance[2]	Combined Income rate[1]	Combined Cost rate	Combined Balance[2]
Historical data:									
1990.....	11.32	9.66	1.66	1.17	1.09	0.09	12.49	10.74	1.75
1991.....	11.44	10.15	1.29	1.21	1.18	.03	12.65	11.33	1.32
1992.....	11.43	10.27	1.16	1.21	1.27	-.06	12.64	11.54	1.10
1993.....	11.40	10.37	1.03	1.21	1.35	-.14	12.61	11.73	.88
1994.....	10.70	10.22	.48	1.89	1.40	.49	12.59	11.62	.97
1995.....	10.70	10.22	.48	1.88	1.44	.44	12.59	11.67	.92
1996.....	10.73	10.06	.68	1.89	1.48	.41	12.62	11.53	1.09
1997.....	10.93	9.83	1.09	1.71	1.44	.28	12.64	11.27	1.37
1998.....	10.96	9.46	1.50	1.72	1.42	.29	12.68	10.88	1.80
1999.....	10.99	9.09	1.90	1.72	1.42	.30	12.71	10.51	2.20
2000.....	10.89	9.02	1.87	1.80	1.43	.37	12.69	10.45	2.24
2001.....	10.89	9.14	1.75	1.82	1.49	.33	12.71	10.63	2.08
2002.....	10.92	9.34	1.58	1.82	1.61	.21	12.74	10.95	1.79
Intermediate:									
2003.....	10.88	9.22	1.66	1.82	1.67	.15	12.70	10.89	1.81
2004.....	10.87	9.08	1.79	1.82	1.74	.09	12.69	10.82	1.88
2005.....	10.88	8.96	1.92	1.82	1.77	.05	12.70	10.73	1.97
2006.....	10.88	8.88	2.00	1.82	1.77	.05	12.70	10.65	2.05
2007.....	10.89	8.87	2.03	1.82	1.80	.03	12.72	10.67	2.05
2008.....	10.91	8.90	2.00	1.83	1.83	[3]	12.73	10.73	2.00
2009.....	10.92	8.97	1.94	1.83	1.87	-.04	12.74	10.84	1.90
2010.....	10.93	9.08	1.85	1.83	1.90	-.07	12.76	10.99	1.78
2011.....	10.97	9.23	1.74	1.83	1.93	-.10	12.80	11.16	1.64
2012.....	10.99	9.41	1.58	1.84	1.96	-.13	12.82	11.37	1.45
2015.....	11.04	10.17	.86	1.84	2.01	-.16	12.88	12.18	.70
2020.....	11.14	11.81	-.67	1.85	2.11	-.26	12.99	13.92	-.93
2025.....	11.24	13.31	-2.08	1.85	2.30	-.45	13.09	15.61	-2.52
2030.....	11.32	14.52	-3.20	1.86	2.36	-.50	13.18	16.88	-3.70
2035.....	11.37	15.17	-3.80	1.86	2.37	-.51	13.23	17.54	-4.31
2040.....	11.39	15.32	-3.93	1.86	2.43	-.57	13.26	17.76	-4.50
2045.....	11.41	15.38	-3.97	1.87	2.52	-.66	13.27	17.91	-4.63
2050.....	11.43	15.61	-4.18	1.87	2.58	-.71	13.30	18.18	-4.89
2055.....	11.46	15.97	-4.52	1.87	2.59	-.72	13.32	18.57	-5.24
2060.....	11.48	16.31	-4.83	1.87	2.57	-.70	13.35	18.88	-5.53
2065.....	11.50	16.56	-5.06	1.87	2.59	-.72	13.37	19.15	-5.79
2070.....	11.52	16.85	-5.33	1.87	2.62	-.75	13.39	19.47	-6.08
2075.....	11.54	17.15	-5.62	1.87	2.64	-.77	13.41	19.79	-6.38
2080.....	11.55	17.45	-5.89	1.87	2.65	-.77	13.43	20.09	-6.67
Low Cost:									
2003.....	10.88	9.14	1.74	1.82	1.62	.20	12.70	10.76	1.94
2004.....	10.87	8.96	1.91	1.82	1.65	.17	12.69	10.61	2.08
2005.....	10.87	8.80	2.08	1.82	1.66	.16	12.70	10.46	2.24
2006.....	10.87	8.67	2.20	1.82	1.63	.19	12.70	10.31	2.39
2007.....	10.88	8.60	2.28	1.82	1.63	.19	12.71	10.23	2.48
2008.....	10.89	8.56	2.34	1.82	1.63	.20	12.72	10.18	2.53
2009.....	10.90	8.56	2.34	1.82	1.63	.19	12.73	10.19	2.54
2010.....	10.91	8.60	2.31	1.83	1.63	.20	12.74	10.23	2.51
2011.....	10.95	8.67	2.27	1.83	1.63	.20	12.78	10.31	2.47
2012.....	10.96	8.79	2.17	1.83	1.63	.20	12.79	10.42	2.37

Table IV.B1.—Estimated Annual Income Rates, Cost Rates, and Balances Calendar Years 1990-2080 (Cont.)

[As a percentage of taxable payroll]

Calendar year	OASI Income rate[1]	OASI Cost rate	OASI Balance[2]	DI Income rate[1]	DI Cost rate	DI Balance[2]	Combined Income rate[1]	Combined Cost rate	Combined Balance[2]
Low Cost (cont.):									
2015.....	11.00	9.39	1.61	1.83	1.68	0.15	12.83	11.07	1.76
2020.....	11.08	10.74	.34	1.84	1.76	.08	12.92	12.50	.42
2025.....	11.16	11.92	-.77	1.84	1.84	.01	13.00	13.76	-.76
2030.....	11.22	12.77	-1.55	1.84	1.81	.03	13.06	14.58	-1.52
2035.....	11.25	13.06	-1.81	1.84	1.78	.07	13.09	14.83	-1.74
2040.....	11.26	12.89	-1.63	1.85	1.79	.05	13.10	14.68	-1.58
2045.....	11.26	12.66	-1.40	1.85	1.83	.02	13.10	14.49	-1.39
2050.....	11.26	12.60	-1.34	1.85	1.84	.01	13.11	14.44	-1.33
2055.....	11.27	12.65	-1.38	1.85	1.83	.02	13.12	14.48	-1.36
2060.....	11.28	12.65	-1.38	1.85	1.80	.05	13.12	14.45	-1.33
2065.....	11.27	12.53	-1.26	1.85	1.80	.04	13.12	14.34	-1.21
2070.....	11.27	12.44	-1.16	1.85	1.82	.03	13.12	14.26	-1.14
2075.....	11.27	12.42	-1.15	1.85	1.84	.01	13.12	14.26	-1.13
2080.....	11.28	12.48	-1.20	1.85	1.85	[3]	13.13	14.32	-1.19
High Cost:									
2003.....	10.89	9.44	1.45	1.82	1.77	.05	12.71	11.21	1.50
2004.....	10.88	9.26	1.62	1.82	1.88	-.05	12.70	11.14	1.56
2005.....	10.88	9.12	1.76	1.83	1.95	-.12	12.71	11.07	1.64
2006.....	10.89	9.24	1.65	1.83	2.01	-.19	12.72	11.26	1.46
2007.....	10.91	9.44	1.47	1.83	2.11	-.28	12.74	11.55	1.19
2008.....	10.92	9.47	1.45	1.83	2.15	-.32	12.76	11.62	1.14
2009.....	10.94	9.62	1.32	1.83	2.22	-.39	12.77	11.83	.94
2010.....	10.96	9.77	1.18	1.84	2.27	-.43	12.79	12.04	.75
2011.....	11.00	9.98	1.02	1.84	2.33	-.48	12.84	12.30	.54
2012.....	11.02	10.22	.80	1.85	2.38	-.53	12.86	12.60	.27
2015.....	11.09	11.11	-.01	1.85	2.41	-.55	12.95	13.51	-.57
2020.....	11.21	13.01	-1.80	1.86	2.52	-.66	13.07	15.53	-2.46
2025.....	11.33	14.84	-3.52	1.87	2.81	-.94	13.20	17.66	-4.46
2030.....	11.43	16.48	-5.04	1.87	2.97	-1.09	13.31	19.45	-6.14
2035.....	11.51	17.62	-6.11	1.88	3.05	-1.17	13.39	20.67	-7.28
2040.....	11.56	18.28	-6.72	1.88	3.18	-1.30	13.44	21.46	-8.02
2045.....	11.60	18.84	-7.24	1.89	3.36	-1.47	13.49	22.20	-8.71
2050.....	11.65	19.59	-7.94	1.89	3.49	-1.59	13.54	23.08	-9.53
2055.....	11.71	20.52	-8.81	1.90	3.56	-1.67	13.60	24.08	-10.48
2060.....	11.77	21.48	-9.72	1.90	3.57	-1.68	13.66	25.06	-11.39
2065.....	11.82	22.43	-10.61	1.90	3.63	-1.73	13.72	26.07	-12.34
2070.....	11.88	23.47	-11.59	1.90	3.67	-1.77	13.78	27.15	-13.36
2075.....	11.94	24.50	-12.55	1.90	3.69	-1.78	13.84	28.18	-14.34
2080.....	11.99	25.39	-13.40	1.90	3.68	-1.78	13.89	29.08	-15.19

[1] Income rates for DI in 2000 and for OASI in 2002 are modified to include adjustments to the lump-sum payments received in 1983 from the General Fund of the Treasury for the cost of noncontributory wage credits for military service in 1940-56.

[2] The years for which the annual balances are projected under the intermediate assumptions to become permanently negative are 2018, 2008, and 2018 for the OASI, DI, and the combined funds, respectively. Under the high cost assumptions the corresponding years are 2015, 2004, and 2014. Under the low cost assumptions, annual balances for the OASI and the combined funds are projected to become permanently negative in 2022. Under the low cost projection the annual balance for the DI fund is projected to become negative in 2026, but return to being positive in 2028, and would be expected to remain positive until shortly after 2080.

[3] Between -0.005 and 0.005 percent of taxable payroll.

Notes:
1. The income rate excludes interest income and certain transfers from the General Fund of the Treasury.
2. Totals do not necessarily equal the sums of rounded components.

Under the intermediate assumptions, the cost rate for DI generally increases over the long-range period from 1.67 percent of taxable payroll for 2003, reaching 2.64 for 2077. The income rate increases only very slightly from

1.82 percent of taxable payroll for 2003 to 1.87 percent for 2077. The annual balance turns negative in 2008, and the annual deficit reaches 0.77 percent for 2077.

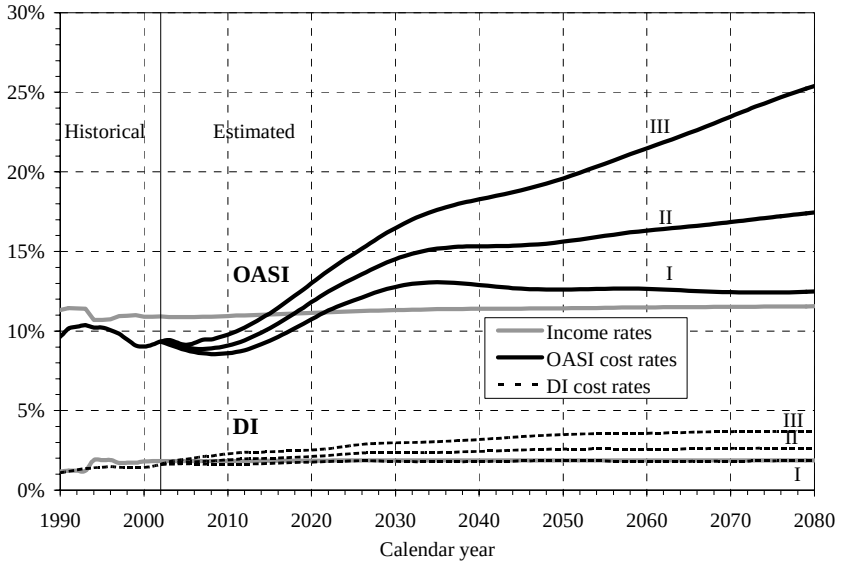
Under the low cost assumptions, the DI cost rate increases much less, reaching 1.84 percent for 2077, with a positive annual balance (except for 2026 and 2027) throughout the period. For the high cost assumptions, DI cost rises much more, reaching 3.69 percent for 2077, with an annual deficit beginning in 2004 and reaching 1.79 percent for 2077.

Figure IV.B1 shows in graphical form the patterns of the OASI and DI annual income rates and cost rates. The income rates shown here are only for alternative II in order to simplify the graphical presentation and because, as shown in table IV.B1, the variation in the income rates by alternative is very small. Income rates increase generally, but at a slow rate for each of the alternatives over the long-range period. Both increases in the income rate and variation among the alternatives result from the relatively small component of income from taxation of benefits. Increases in income from taxation of benefits reflect increases in the total amount of benefits paid and the fact that an increasing share of individual benefits will be subject to taxation, because benefit taxation threshold amounts are not indexed.

The patterns of the annual balances for OASI and DI are indicated in figure IV.B1. For each alternative, the magnitude of each of the positive balances in the early years, as a percent of taxable payroll, is represented by the distance between the appropriate cost-rate curve and the income-rate curve above it. The magnitude of each of the deficits in subsequent years is represented by the distance between the appropriate cost-rate curve and the income-rate curve below it.

In the future, the cost of OASI, DI and the combined OASDI program as a percent of taxable payroll will not necessarily be within the range encompassed by alternatives I and III. Nonetheless, because alternatives I and III define a reasonably wide range of demographic and economic conditions, the resulting estimates delineate a reasonable range for consideration of potential future program costs.

Figure IV.B1.—Long-Range OASI and DI Annual Income Rates and Cost Rates
[As a percentage of taxable payroll]



The cost of the OASDI program has been discussed in this section in relation to taxable payroll, which is a program-related concept that is very useful in analyzing the financial status of the OASDI program. The cost can also be discussed in relation to broader economic concepts, such as the gross domestic product (GDP). OASDI outlays generally rise from about 4.4 percent of GDP currently to about 7.0 percent of GDP by the end of the 75-year projection period under alternative II. Discussion of both the cost and the taxable payroll of the OASDI program in relation to GDP is presented in appendix VI.F.2 beginning on page 172.

2. Comparison of Workers to Beneficiaries

The primary reason that the estimated OASDI cost rate increases rapidly after 2010 is that the number of beneficiaries is projected to increase more rapidly than the number of covered workers. This occurs because the relatively large number of persons born during the baby-boom generation will reach retirement age, and begin to receive benefits, while the relatively small number of persons born during the subsequent period of low fertility rates will comprise the labor force. A comparison of the numbers of covered workers and beneficiaries is shown in table IV.B2.

Table IV.B2.—Covered Workers and Beneficiaries, Calendar Years 1945-2080

Calendar year	Covered workers[1] (in thousands)	Beneficiaries[2] (in thousands)			Covered workers per OASDI beneficiary	Beneficiaries per 100 covered workers
		OASI	DI	OASDI		
Historical data:						
1945	46,390	1,106	—	1,106	41.9	2
1950	48,280	2,930	—	2,930	16.5	6
1955	65,200	7,563	—	7,563	8.6	12
1960	72,530	13,740	522	14,262	5.1	20
1965	80,680	18,509	1,648	20,157	4.0	25
1970	93,090	22,618	2,568	25,186	3.7	27
1975	100,200	26,998	4,125	31,123	3.2	31
1980	113,649	30,384	4,734	35,118	3.2	31
1985	120,565	32,776	3,874	36,650	3.3	30
1990	133,672	35,266	4,204	39,470	3.4	30
1991	132,969	35,785	4,388	40,172	3.3	30
1992	133,890	36,314	4,716	41,029	3.3	31
1993	136,117	36,758	5,083	41,840	3.3	31
1994	138,197	37,082	5,435	42,516	3.3	31
1995	141,052	37,376	5,731	43,108	3.3	31
1996	143,450	37,521	5,977	43,498	3.3	30
1997	146,145	37,705	6,087	43,793	3.3	30
1998	148,786	37,826	6,250	44,076	3.4	30
1999	151,293	37,934	6,433	44,367	3.4	29
2000	153,517	38,560	6,606	45,166	3.4	29
2001	153,743	38,888	6,780	45,668	3.4	30
2002	152,795	39,116	7,060	46,176	3.3	30
Intermediate:						
2005	158,390	40,066	8,051	48,118	3.3	30
2010	166,932	43,408	9,336	52,744	3.2	32
2015	171,837	49,809	10,200	60,009	2.9	35
2020	175,428	57,431	11,010	68,441	2.6	39
2025	178,369	64,779	12,167	76,946	2.3	43
2030	181,372	71,301	12,717	84,018	2.2	46
2035	184,433	75,535	13,090	88,625	2.1	48
2040	187,554	77,728	13,651	91,379	2.1	49
2045	190,281	79,450	14,310	93,760	2.0	49
2050	192,700	81,742	14,763	96,504	2.0	50
2055	195,024	84,626	15,056	99,682	2.0	51
2060	197,408	87,357	15,164	102,521	1.9	52
2065	199,738	89,725	15,480	105,205	1.9	53
2070	201,907	92,265	15,803	108,067	1.9	54
2075	203,950	94,832	16,075	110,908	1.8	54
2080	205,937	97,341	16,292	113,633	1.8	55
Low Cost:						
2005	159,711	40,075	7,763	47,837	3.3	30
2010	169,880	43,391	8,429	51,820	3.3	31
2015	176,144	49,345	9,808	59,152	3.0	34
2020	180,977	56,542	10,132	66,674	2.7	37
2025	185,341	63,393	10,598	73,990	2.5	40
2030	190,219	69,290	10,705	79,995	2.4	42
2035	195,793	72,800	10,855	83,654	2.3	43
2040	201,998	74,341	11,266	85,608	2.4	42
2045	208,408	75,594	11,813	87,407	2.4	42
2050	214,881	77,611	12,240	89,851	2.4	42
2055	221,637	80,344	12,596	92,940	2.4	42
2060	228,892	82,924	12,870	95,794	2.4	42
2065	236,633	85,047	13,373	98,420	2.4	42
2070	244,575	87,354	13,957	101,311	2.4	41
2075	252,628	90,068	14,544	104,612	2.4	41
2080	260,776	93,270	15,094	108,364	2.4	42

Table IV.B2.—Covered Workers and Beneficiaries, Calendar Years 1945-2080 (Cont.)

Calendar year	Covered workers[1] (in thousands)	Beneficiaries[2] (in thousands)			Covered workers per OASDI beneficiary	Beneficiaries per 100 covered workers
		OASI	DI	OASDI		
High Cost:						
2005	157,178	40,032	8,538	48,570	3.2	31
2010	163,748	43,414	10,529	53,944	3.0	33
2015	167,948	50,356	10,745	61,101	2.7	36
2020	170,859	58,482	12,033	70,515	2.4	41
2025	172,952	66,483	13,871	80,354	2.2	46
2030	174,760	73,881	14,864	88,746	2.0	51
2035	176,060	79,179	15,472	94,651	1.9	54
2040	176,896	82,446	16,202	98,648	1.8	56
2045	176,805	85,108	16,999	102,107	1.7	58
2050	176,086	88,162	17,499	105,661	1.7	60
2055	174,997	91,681	17,724	109,405	1.6	63
2060	173,712	95,034	17,633	112,666	1.5	65
2065	172,035	98,075	17,708	115,784	1.5	67
2070	170,046	101,247	17,672	118,919	1.4	70
2075	167,858	104,098	17,516	121,614	1.4	72
2080	165,612	106,364	17,308	123,671	1.3	75

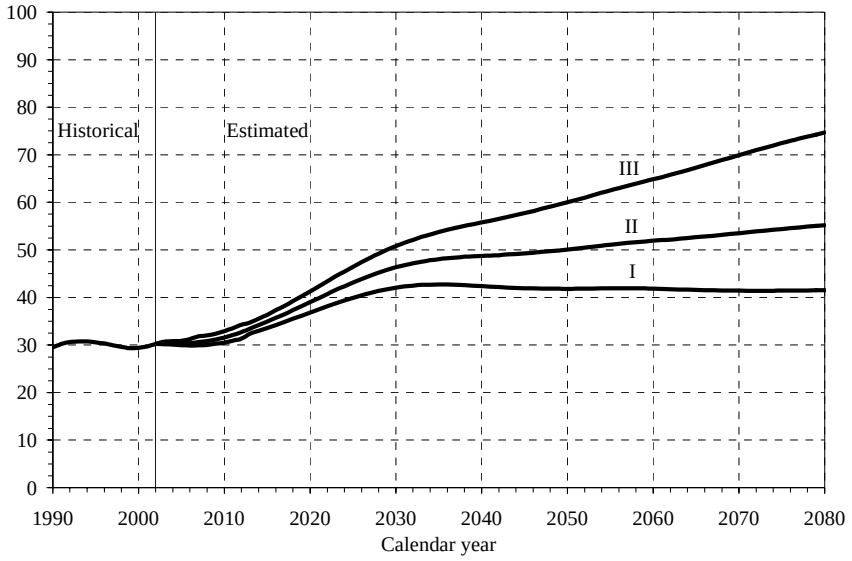
[1] Workers who are paid at some time during the year for employment on which OASDI taxes are due.
[2] Beneficiaries with monthly benefits in current-payment status as of June 30.

Notes:
1. The number of beneficiaries does 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. Totals do not necessarily equal the sums of rounded components.
2. Historical covered worker data are subject to revision.

Table IV.B2 shows that the number of covered workers per beneficiary, which was about 3.3 in 2002, is estimated to decline in the future. Based on the low cost assumptions, for which high fertility rates and small reductions in death rates are assumed, the ratio declines to 2.3 by 2033, and then rises back to a level of 2.4 by 2039. Based on the high cost assumptions, for which low fertility rates and large reductions in death rates are assumed, the decline is much greater, reaching 1.8 by 2036, and 1.4 workers per beneficiary by 2069. Based on the intermediate assumptions, the ratio declines to 2.1 by 2031, and 1.8 workers per beneficiary by 2074.

The impact of the demographic shifts under the three alternatives on the OASDI cost rates is better understood by considering the projected number of beneficiaries per 100 workers. As compared to the 2002 level of 30 beneficiaries per 100 covered workers, this ratio is estimated to rise significantly by 2080 to 42 under the low cost assumptions, 55 under the intermediate assumptions, and 75 under the high cost assumptions. The significance of these numbers can be seen by comparing figure IV.B1 to figure IV.B2.

Figure IV.B2.—Number of OASDI Beneficiaries Per 100 Covered Workers



For each alternative, the shape of the curve in figure IV.B2, which shows beneficiaries per 100 covered workers, is strikingly similar to that of the corresponding cost-rate curve in figure IV.B1, thereby emphasizing the extent to which the cost of the OASDI program as a percentage of taxable payroll is determined by the age distribution of the population. Because the cost rate is basically the product of the number of beneficiaries and their average benefit, divided by the product of the number of covered workers and their average taxable earnings (and because average benefits rise at about the same rate as average earnings), it is to be expected that the pattern of the annual cost rates is similar to that of the annual ratios of beneficiaries to workers.

3. Trust Fund Ratios

Trust fund ratios are useful indicators of the adequacy of the financial resources of the Social Security program at any point in time. For any year in which the projected trust fund ratio is positive (i.e., the trust fund holds assets at the beginning of the year), but is not positive for the following year, the trust fund is projected to become exhausted during the year. Under present law, the OASI and DI Trust Funds do not currently have the authority to borrow. Therefore, exhaustion of the assets in either fund during a year, would mean there are no longer sufficient assets in the fund to cover the full amount of benefits scheduled for the year under present law.

The trust fund ratio also serves an additional important purpose in assessing the actuarial status of the program. When the financing is adequate for the timely payment of full benefits throughout the long-range period, the stability of the trust fund ratio toward the end of the period indicates the likelihood that this projected adequacy will continue for subsequent Trustees Reports. If the trust fund ratio toward the end of the period is level (or increasing) then projected adequacy for the long-range period is likely to continue for subsequent reports.

Table IV.B3 shows, by alternative, the estimated trust fund ratios (without regard to advance tax transfers that would be effected after the end of the 10-year, short-range period) for the separate and combined OASI and DI Trust Funds. Also shown in this table is the year in which a fund is estimated to become exhausted, reflecting the effect of the provision for advance tax transfers. The patterns of the OASI and DI trust fund ratios, over the 75-year period, are shown graphically in figure IV.B3 for all three sets of assumptions. A graphical presentation of the combined OASDI ratios is shown in figure II.D7 on page 15.

Based on the intermediate assumptions, the OASI trust fund ratio rises steadily from 301 percent at the beginning of 2003, reaching a peak of 526 percent at the beginning of 2016. This increase in the OASI trust fund ratio results from the fact that the annual income rate (which excludes interest) exceeds annual outgo for several years (see table IV.B1). Thereafter, the OASI trust fund ratio declines steadily, with the OASI Trust Fund becoming exhausted in 2044. The DI trust fund ratio follows a pattern that is similar but unfolds more rapidly. The DI trust fund ratio is estimated to rise from 219 percent at the beginning of 2003 to a peak of 226 percent for 2007, and to decline thereafter until becoming exhausted in 2028.

The trust fund ratio for the combined OASI and DI Trust Funds rises from 288 percent for 2003 to a peak of 471 percent at the beginning of 2016. Thereafter, the ratio declines, with the combined funds becoming exhausted in 2042. Based on the intermediate estimates in last year's report, the peak fund ratio for the combined funds was estimated to be 471 percent for 2015 and the year of exhaustion was estimated to be 2041.

The trust fund ratio for the OASDI program first declines in 2017, about 1 year before annual expenditures begin to exceed noninterest income. This occurs because the increase in trust fund assets during 2016, which reflects interest income and a small excess of noninterest income over cost, occurs at a slower rate than does the increase in the annual cost of the program between 2016 and 2017.

After 2016 the dollar amount of assets is projected to continue to rise through the beginning of 2028 because interest income more than offsets the shortfall

in noninterest income. Beginning in 2018, the OASDI program is projected to experience increasingly large cash-flow shortfalls that will require the trust funds to redeem special public-debt obligations of the General Fund of the Treasury. This will differ from the experience of recent years when the trust funds have been net lenders to the General Fund of the Treasury. The change in the cash flow between the trust funds and the general fund is expected to have important public policy and economic implications that go well beyond the operation of the OASDI program itself.

Based on the low cost assumptions, the trust fund ratio for the DI program increases throughout the long-range projection period, reaching the extremely high level of 1,119 percent for 2078. At the end of the long-range period, the DI trust fund ratio is rising by 15 percentage points per year. Thus, subsequent reports are likely to contain projections of adequate long-range financing of the DI program under a similar optimistic set of assumptions. For the OASI program, the trust fund ratio rises to a peak of 636 percent for 2019, dropping thereafter to a level of 394 percent by 2078. At the end of the period the OASI trust fund ratio is declining by 4 percentage points per year. The long-term outlook for the DI program is improved more than for the OASI program largely because lower assumed disability incidence rates have a substantial effect on the DI program but little net effect on the OASI program. For the OASDI program, the trust fund ratio follows a pattern similar to that for OASI, peaking at 606 percent for 2020, and then falling to 488 percent for 2078, with an annual decline at a rate of 2 percentage points. Thus, due to the size of the trust fund ratios and their near stability, subsequent Trustees Reports are likely to contain projections of adequate long-range financing of the OASI and combined OASI and DI program under the low cost assumptions. A stable trust fund ratio at the end of the valuation period indicates that the actuarial balance for Trustees Reports in subsequent years can be expected to remain about the same as long as assumptions are realized.

In contrast, under the high cost assumptions, the OASI trust fund ratio is estimated to peak at 428 percent for 2013, thereafter declining to fund exhaustion by the end of 2033. The DI trust fund ratio is estimated to peak at 211 percent for 2003, thereafter declining to fund exhaustion by the end of 2015. The combined OASDI trust fund ratio is estimated to rise to a peak of 357 percent for 2012, declining thereafter to fund exhaustion by the end of 2031.

Thus, because large ultimate cost rates are projected under all but the low cost assumptions, it is likely that income will eventually need to be increased and/or program costs will need to be reduced in order to prevent the trust funds from becoming exhausted.

Even under the high cost assumptions, however, the combined OASI and DI funds on hand plus their estimated future income would be able to cover their combined cost for 28 years into the future (until 2031). Under the intermediate assumptions the combined starting funds plus estimated future income would be able to cover cost for about 39 years into the future (until 2042). The program would be able to cover cost for the foreseeable future under the more optimistic low cost assumptions. In the 2002 report, the combined trust funds were projected to become exhausted in 2029 under the high cost assumptions and in 2041 under the intermediate assumptions.

Table IV.B3.—Estimated Trust Fund Ratios, Calendar Years 2003-80
[In percent]

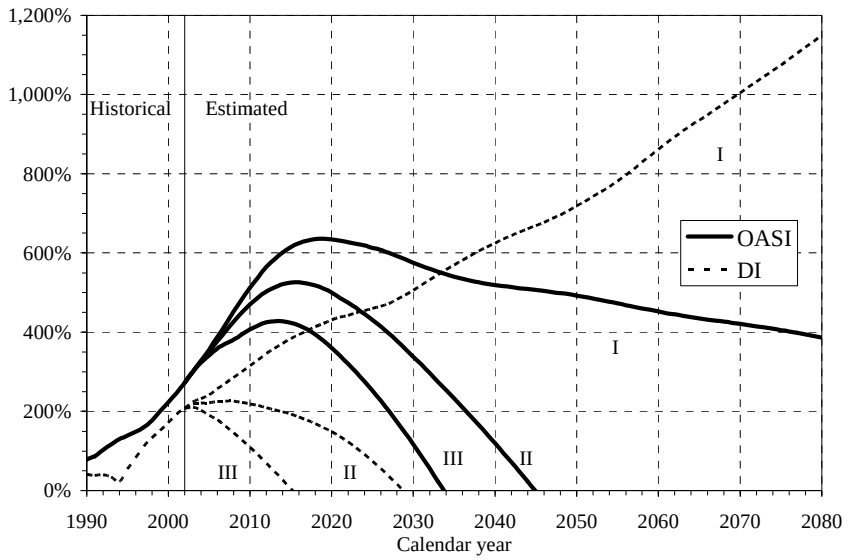
Calendar year	Intermediate			Low Cost			High Cost		
	OASI	DI	Combined	OASI	DI	Combined	OASI	DI	Combined
2003	301	219	288	301	224	289	301	211	286
2004	326	221	309	328	232	313	323	203	303
2005	351	222	330	357	242	339	342	190	315
2006	377	225	352	388	257	367	359	179	327
2007	402	226	373	419	271	396	371	163	333
2008	427	226	392	452	286	425	381	146	337
2009	449	223	410	483	300	453	394	128	344
2010	470	219	426	512	315	481	407	109	351
2011	488	215	440	539	330	506	417	90	355
2012	503	209	452	565	346	531	425	69	357
2015	525	193	470	615	384	580	424	5	350
2020	500	149	447	634	431	606	361	[1]	284
2025	431	74	378	613	460	593	252	[1]	173
2030	338	[1]	287	575	506	567	117	[1]	34
2035	232	[1]	183	540	570	544	[1]	[1]	[1]
2040	120	[1]	69	519	625	532	[1]	[1]	[1]
2045	[1]	[1]	[1]	507	669	527	[1]	[1]	[1]
2050	[1]	[1]	[1]	492	719	521	[1]	[1]	[1]
2055	[1]	[1]	[1]	473	781	512	[1]	[1]	[1]
2060	[1]	[1]	[1]	452	862	503	[1]	[1]	[1]
2065	[1]	[1]	[1]	435	935	498	[1]	[1]	[1]
2070	[1]	[1]	[1]	421	1,004	495	[1]	[1]	[1]
2075	[1]	[1]	[1]	405	1,074	491	[1]	[1]	[1]
2080	[1]	[1]	[1]	386	1,150	484	[1]	[1]	[1]
Trust fund is estimated to become exhausted in	2044	2028	2042	[2]	[2]	[2]	2033	2015	2031

[1] The trust fund is estimated to be exhausted by the beginning of this year. The last line of the table shows the specific year of trust fund exhaustion.
[2] The fund is not estimated to be exhausted within the projection period.

Note: See definition of trust fund ratio on page 208. The combined ratios shown for years after the DI fund is estimated to be exhausted are theoretical and are shown for informational purposes only.

A graphic illustration of the trust fund ratios for the separate OASI and DI Trust Funds is shown in figure IV.B3 for each of the alternative sets of assumptions. A graphic illustration of the trust fund ratios for the combined trust funds is shown in figure II.D7.

Figure IV.B3.—Long-Range OASI and DI Trust Fund Ratios
[Assets as a percentage of annual expenditures]



4. Summarized Income Rates, Cost Rates, and Balances

Summarized values for the full 75-year period are useful in analyzing the long-range adequacy of financing for the program over the period as a whole under present law and under proposed modifications to the law. In order to focus on the full 75-year period as well as on broad patterns through the period, tables IV.B4 and IV.B5 summarize, on a present-value basis, the projected annual figures shown in table IV.B1 for various periods within the overall 75-year projection period.

Table IV.B4 shows rates on a present-value basis summarized for each of the 25-year subperiods, excluding both the assets of the trust funds on hand at the beginning of the period and the cost of accumulating a target trust fund balance by the end of the period. These rates are useful for comparing the total cash flows of tax income and cost, as an indicator of the degree to which tax income during the period is sufficient to meet the cost estimated for the period.

For the OASDI program, a positive balance is projected for the first 25-year subperiod under both the low cost and intermediate assumptions. A deficit is projected for the first 25-year subperiod under the high cost assumptions. Deficits are projected for the second and third subperiods under all three alternatives.

Table IV.B4.—Summarized Income Rates, Cost Rates, and Balances for 25-Year Subperiods,[1] Calendar Years 2003-77
[As a percentage of taxable payroll]

	OASI			DI			Combined		
Subperiod	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance
Intermediate:									
2003-27	11.03	10.53	0.49	1.84	2.00	-0.16	12.86	12.53	0.33
2028-52	11.38	15.15	-3.78	1.86	2.44	-.58	13.24	17.60	-4.36
2053-77	11.49	16.52	-5.03	1.87	2.60	-.73	13.36	19.12	-5.76
Low Cost:									
2003-27	10.99	9.79	1.20	1.83	1.70	.13	12.82	11.50	1.32
2028-52	11.24	12.80	-1.55	1.85	1.81	.04	13.09	14.61	-1.52
2053-77	11.27	12.55	-1.28	1.85	1.82	.03	13.12	14.37	-1.25
High Cost:									
2003-27	11.07	11.43	-.36	1.85	2.37	-.52	12.92	13.80	-.88
2028-52	11.54	18.04	-6.50	1.88	3.19	-1.31	13.42	21.22	-7.80
2053-77	11.81	22.30	-10.48	1.90	3.62	-1.72	13.71	25.91	-12.20

[1] Income rates do not include beginning trust fund balances and cost rates do not include the cost of accumulating target trust fund balances.

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

Table IV.B5 shows summarized rates for valuation periods of the first 25, the first 50, and the entire 75 years of the long-range projection period, including the funds on hand at the start of the period and the cost of accumulating a target trust fund balance equal to 100 percent of annual cost by the end of the period. The actuarial balance for each of these three valuation periods is equal to the difference between the summarized income rate and the summarized cost rate for the corresponding period. An actuarial balance of zero for any period would indicate that estimated cost for the period could be met, on average, with a remaining trust fund balance at the end of the period equal to 100 percent of the following year's cost. A negative actuarial balance indicates that, over the next 75 years, the present value of income to the program plus the existing trust fund falls short of the present value of the cost of the program plus the cost of reaching a target trust fund balance of 1 year's cost by the end of the period. Combined with a falling trust fund ratio, this signals the possibility of continuing cash-flow deficits, implying that the current-law level of financing is not sustainable.

Table IV.B5.—Summarized Income Rates, Cost Rates, and Actuarial Balances for Valuation Periods,[1] Calendar Years 2003-77

[As a percentage of taxable payroll]

Valuation period	OASI			DI			Combined		
	Income rate	Cost rate	Actuarial balance	Income rate	Cost rate	Actuarial balance	Income rate	Cost rate	Actuarial balance
Intermediate:									
25 years:									
2003-27.	12.33	11.01	1.32	2.01	2.08	-0.07	14.34	13.09	1.26
50 years:									
2003-52.	11.94	12.63	-.68	1.95	2.21	-.26	13.89	14.84	-.95
75 years:									
2003-77.	11.85	13.41	-1.56	1.93	2.29	-.35	13.78	15.70	-1.92
Low Cost:									
25 years:									
2003-27.	12.28	10.21	2.07	2.00	1.76	.24	14.28	11.98	2.31
50 years:									
2003-52.	11.86	11.19	.66	1.94	1.77	.17	13.80	12.97	.83
75 years:									
2003-77.	11.73	11.45	.28	1.92	1.78	.14	13.65	13.23	.42
High Cost:									
25 years:									
2003-27.	12.38	11.98	.40	2.02	2.47	-.45	14.40	14.45	-.05
50 years:									
2003-52.	12.03	14.44	-2.41	1.96	2.76	-.79	14.00	17.20	-3.20
75 years:									
2003-77.	11.99	16.07	-4.09	1.95	2.93	-.98	13.93	19.00	-5.07

[1] Income rates include beginning trust fund balances and cost rates include the cost of reaching a target trust fund level of 1 year's cost at the end of the period.

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

The values in table IV.B5 show that the combined OASDI program is expected to operate with a positive actuarial balance over the 25-year valuation period under the low cost and intermediate assumptions. For the 25-year valuation period the summarized values indicate actuarial balances of 2.31 percent of taxable payroll under the low cost assumptions, 1.26 percent under the intermediate assumptions, and -0.05 percent under the high cost assumptions. Thus, the program is more than adequately financed for the 25-year valuation period under all but the high cost projections. For the 50-year valuation period the OASDI program would have a positive actuarial balance of 0.83 percent under the low cost assumptions, but would have deficits of 0.95 percent under the intermediate assumptions and 3.20 percent under the high cost assumptions. Thus, the program is more than adequately financed for the 50-year valuation period under only the low cost set of assumptions.

For the entire 75-year valuation period, the combined OASDI program would again have actuarial deficits except under the low cost set of assumptions. The actuarial balance for this long-range valuation period is projected to be 0.42 percent of taxable payroll under the low cost assumptions,

-1.92 percent under the intermediate assumptions, and -5.07 percent under the high cost assumptions.

Assuming the Trustees' intermediate assumptions are realized, the deficit of 1.92 percent of payroll indicates that financial adequacy of the program for the next 75 years could be restored if the Social Security payroll tax were immediately and permanently increased from its current level of 12.4 percent (combined employee-employer shares) to 14.32 percent. Alternatively, all current and future benefits could be reduced by about 13 percent (or there could be some combination of tax increases and benefit reductions). Changes of this magnitude would be sufficient to eliminate the actuarial deficit over the 75-year projection period. However, because of the projected increase in the average age of the population, projected annual deficits begin in 2018 and increase to levels in excess of 6 percent of taxable payroll by the end of the 75-year period. The large annual deficits at the end of the projection period indicate that the annual cost will very likely continue to exceed tax revenues after 2077. As a result, ensuring the sustainability of the system would eventually require larger changes than those needed to restore actuarial balance for the 75-year period. For the infinite future, the actuarial deficit is estimated to be 3.8 percent of taxable payroll under the intermediate assumptions. This means that financial adequacy of the OASDI program could be restored permanently if the combined payroll tax rate were immediately raised from 12.4 percent to 16.2 percent, or if benefits were immediately reduced by 23 percent.

As may be concluded from tables IV.B4 and IV.B5, the financial condition of the DI program is substantially weaker than that of the OASI program for the first 25 years. Summarized over the full 75-year period, however, long-range deficits for the OASI and DI programs under intermediate assumptions are more similar, relative to the level of program costs.

Table IV.B6 presents the components and the calculation of the long-range (75-year) actuarial balance under the intermediate assumptions. The present value of future cost less future tax income over the long-range period, minus the amount of trust fund assets at the beginning of the projection period, amounts to $3.5 trillion. This amount is referred to as the 75-year "open group unfunded obligation." The actuarial deficit (i.e., the negative of the actuarial balance) combines this unfunded obligation with the present value of the "ending target trust fund," and expresses the total as a percentage of the present value of the taxable payroll for the period. The present value of future tax income minus cost, plus starting trust fund assets, minus the present value of the ending target trust fund amounts to -$3.8 trillion. Expressed as a percentage of taxable payroll for the period, this is the actuarial balance of -1.92 percent.

Table IV.B6.—Components of 75-Year OASDI Actuarial Balance Under Intermediate Assumptions (2003-77)

Item	OASI	DI	Combined
Present value as of January 1, 2003 (in billions):			
a. Payroll tax revenue	$21,164	$3,594	$24,758
b. Taxation of benefits revenue	1,284	106	1,389
c. Tax income (a + b)	22,448	3,700	26,147
d. Cost	26,544	4,531	31,075
e. Cost minus tax income (d - c)	4,096	831	4,927
f. Trust fund assets at start of period	1,217	160	1,378
g. Open group unfunded obligation (e - f)	2,879	671	3,550
h. Ending target trust fund[1]	243	37	280
i. Income minus cost, plus assets at start of period, minus ending target trust fund (c - d + f - h)	-3,121	-708	-3,829
j. Taxable payroll	199,758	199,758	199,758
Percent of taxable payroll:			
Actuarial balance (i ÷ j)	-1.56	-.35	-1.92

[1]The calculation of the actuarial balance includes the cost of accumulating a target trust fund balance equal to 100 percent of annual cost by the end of the period.

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

5. Additional Measures of OASDI Unfunded Obligations

As shown in the previous section, a negative actuarial balance (or an actuarial deficit) provides one measure of the unfunded obligation of the program over a period of time. Two additional measures of OASDI unfunded obligations under the intermediate assumptions are presented below.

a. Open Group Unfunded Obligations

Consistent with practice since 1965, this report focuses on the 75-year period from 2003 to 2077 for the evaluation of the long-run financial status of the OASDI program on an open group basis (i.e., including both current and future participants). Table IV.B7 shows that the present value of open group unfunded obligations for the program over that period is $3.5 trillion. Some experts, however, have described the limitations of using a 75-year period. Overemphasis of summary measures (such as the actuarial balance and open group unfunded obligations) for the 75-year period can lead to incorrect perceptions and policy that fails to address sustainability.

In order to provide a fuller description of long-run unfunded obligations of the OASDI program, this section presents estimates of obligations that extend to the infinite horizon. The extension assumes that the current-law OASDI program and the demographic and economic trends used for the 75-year projection continue indefinitely. Table IV.B7 shows that extending the calculations beyond 2077 adds $7.0 trillion to estimated unfunded obligations, making the total open group unfunded obligation $10.5 trillion. The $7.0 trillion increment reflects a significant financing gap for OASDI after 2077.

Table IV.B7.—Unfunded OASDI Obligations From Program Inception Through the Infinite Horizon
[Present values as of 1-1-2003, trillions of dollars]

Unfunded obligations through the infinite horizon[1]	$10.5
Unfunded obligations from program inception through 2077	3.5
Unfunded obligations from 2078 through the infinite horizon	7.0

[1] Present value of future cost less future taxes, reduced by the amount of trust fund assets at the beginning of the period. This concept is also referred to as the infinite horizon open group obligation.

b. Closed Group Unfunded Obligations

The Financial Report of the United States, consistent with recommendations of the Federal Accounting Standards Advisory Board (FASAB), reports present values of net future OASDI obligations over the next 75 years, separately for current participants at ages 62 and over in 2003 and for current participants at ages 15 through 61 in 2003. Combining these values yields a closed group net obligation that excludes past and future participants.[1]

The first line of table IV.B8 shows the present value of future cost less future taxes over the next 100 years for all current participants. Subtracting the current value of the trust fund (the accumulated value of past OASDI taxes less cost) gives a closed group (excluding only future participants) unfunded obligation of $10.5 trillion. For the Social Security benefits to be sustainable for the infinite future, the contributions of current and future participants in the system must fully offset the shortfall due to past and current participants. However, future participants, as a whole, are projected to pay, in present value, taxes that are approximately equal to the cost of providing benefits they are scheduled to receive over the infinite future. Thus, the long run financing gap that program reforms must ultimately close is $10.5 trillion in present value. This can be achieved by raising additional revenue or reducing benefits (or some combination) for current and future participants so that the present value of the additional revenue or reduced benefits for the infinite future equals $10.5 trillion.

[1] *Accounting for Social Insurance*, Statement of Recommended Accounting Standards, Number 17, Federal Accounting Standards Advisory Board, August 1999 (p. 36).

Table IV.B8.—Present Values of OASDI Cost Less Tax Revenue and Unfunded Obligations for Program Participants
[Present values as of 1-1-2003, trillions of dollars]

Present value of future cost less future taxes for current participants[1]	$11.9
Less current trust fund (tax accumulations minus expenditures to date for past and current participants)	1.4
Equals unfunded obligations for past and current participants[2]	10.5
Less present value of taxes less cost for future participants for the infinite future	.0
Equals unfunded obligations for all participants for the infinite future	10.5

[1] The Financial Report of the United States separates these obligations into two parts: current participants at ages 62 and over in 2002 ($4.0 trillion) and current participants at ages 15 to 61 in 2002 ($7.2 trillion). The sum of the two parts is less than the number in the table because the calculation is done over 75 years for the Financial Report (a period that does not capture the complete lifetime of all current participants), the 75-year valuation period begins one year earlier, and the intermediate assumptions and methods of the 2002 Trustees Report are used.
[2] This concept is also referred to as the closed group unfunded obligation.

6. Test of Long-Range Close Actuarial Balance

The long-range test of close actuarial balance applies to a set of valuation periods beginning with the first 10 years and continuing through the first 11 years, the first 12 years, etc., up to and including the full 75-year projection period. Under the long-range test, the summarized income rate and cost rate are calculated for each of the 66 valuation periods in the full 75-year long-range projection period, with the first of these periods consisting of the next 10 years. Each succeeding period becomes longer by 1 year, culminating with the period consisting of the next 75 years. The long-range test is met if, for each of the 66 time periods, the actuarial balance is not less than zero or is negative by, at most, a specified percentage of the summarized cost rate for the same time period. The percentage allowed for a negative actuarial balance is 5 percent for the full 75-year period. For shorter periods, the allowable percentage begins with zero for the first 10 years and increases uniformly for longer periods, until it reaches the maximum percentage of 5 percent allowed for the 75-year period. The criterion for meeting the test is less stringent for the longer periods in recognition of the greater uncertainty associated with estimates for more distant years.

When a negative actuarial balance in excess of the allowable percentage of the summarized cost rate is projected for one or more of the 66 separate valuation periods, the program fails the long-range test of close actuarial balance. Being out of close actuarial balance indicates that the program is expected to experience financial problems in the future and that ways of improving the financial status of the program should be considered. The sooner the actuarial balance is less than the minimum allowable balance, expressed as a percentage of the summarized cost rate, the more urgent is the need for corrective action. However, it is recognized that necessary changes in program financing or benefit provisions should not be put off until the last possi-

ble moment if future beneficiaries and workers are to effectively plan for their retirement.

Table IV.B9 presents a comparison of the estimated actuarial balances with the minimum allowable balance (or maximum allowable deficit) under the long-range test, each expressed as a percentage of the summarized cost rate, based on the intermediate estimates. Values are shown for only 14 of the valuation periods: those of length 10 years, 15 years, and continuing in 5-year increments through 75 years. However, each of the 66 periods—those of length 10 years, 11 years, and continuing in 1-year increments through 75 years—is considered for the test. These minimum allowable balances are calculated to show the limit for each valuation period resulting from the graduated tolerance scale. The patterns in the estimated balances as a percentage of the summarized cost rates, as well as that for the minimum allowable balance, are presented graphically in figure IV.B4 for the OASI, DI and combined OASDI program. Values shown for the 25-year, 50-year, and 75-year valuation periods correspond to those presented in table IV.B5.

For the OASI program, the estimated actuarial balance as a percentage of the summarized cost rate exceeds the minimum allowable for valuation periods of length 10 years through 42 years, under the intermediate estimates. For valuation periods of length greater than 42 years, the estimated actuarial balance is less than the minimum allowable. For the full 75-year long-range period the estimated actuarial balance reaches -11.65 percent of the summarized cost rate, for a shortfall of 6.65 percent, from the minimum allowable balance of -5.0 percent of the summarized cost rate. Thus, although the OASI program satisfies the short-range test of financial adequacy (as discussed earlier on page 33), it is not in long-range close actuarial balance.

For the DI program, the estimated actuarial balance as a percentage of the summarized cost rate exceeds the minimum allowable balance for valuation periods of length 10 through 21 years under the intermediate estimates. For valuation periods of length greater than 21 years, the estimated actuarial balance is less than the minimum allowable. For the full 75-year long-range period the estimated actuarial balance reaches -15.50 percent of the summarized cost rate, for a shortfall of 10.50 percent, from the minimum allowable balance of -5.0 percent of the summarized cost rate. Thus, the DI program, although meeting the short-range test of financial adequacy, is not in long-range close actuarial balance.

Financing for the DI program is much less adequate than for the OASI program during the first 25 years even though long-range actuarial deficits are more comparable over the entire 75-year period. This occurs because much more of the increase in the long-range cost due to the aging of the large baby-boom generation occurs earlier for the DI program than for the OASI

program. As a result, tax rates that are relatively more adequate for the OASI program during the first 25 years become relatively less adequate later in the long-range period.

For the OASDI program, the estimated actuarial balance as a percentage of the summarized cost rate exceeds the minimum allowable balance for valuation periods of length 10 years through 39 years. For valuation periods of length greater than 39 years, the estimated actuarial balance is below the minimum allowable balance. The size of the shortfall from the minimum allowable balance rises gradually, reaching 7.21 percent of the summarized cost rate for the full 75-year long-range valuation period. Thus, although the OASDI program satisfies the short-range test of financial adequacy, it is out of long-range close actuarial balance.

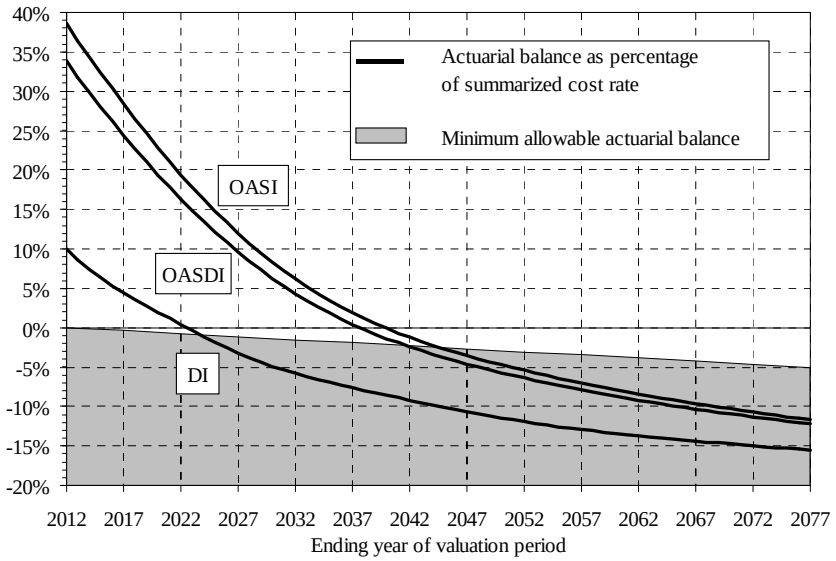
The OASI and DI programs, both separate and combined, were also found to be out of close actuarial balance in last year's report. The estimated deficits for the OASI, DI, and combined OASDI program in this report are similar to those shown in last year's report.

Table IV.B9.—Comparison of Estimated Long-Range Actuarial Balances With the Minimum Allowable in the Test for Close Actuarial Balance, Based on Intermediate Assumptions

	Rates (percentage of taxable payroll)			Values expressed as a percentage of cost rate	
Valuation period	Summarized income rate	Summarized cost rate	Actuarial balance	Actuarial balance	Minimum allowable actuarial balance
OASI:					
10 years: 2003-2012	13.86	10.00	3.86	38.60	0.00
15 years: 2003-2017	12.98	10.11	2.87	28.38	-.38
20 years: 2003-2022	12.56	10.52	2.04	19.39	-.77
25 years: 2003-2027	12.33	11.01	1.32	12.02	-1.15
30 years: 2003-2032	12.19	11.48	.71	6.19	-1.54
35 years: 2003-2037	12.10	11.88	.22	1.88	-1.92
40 years: 2003-2042	12.03	12.18	-.15	-1.22	-2.31
45 years: 2003-2047	11.98	12.42	-.44	-3.53	-2.69
50 years: 2003-2052	11.94	12.63	-.68	-5.41	-3.08
55 years: 2003-2057	11.91	12.81	-.90	-7.03	-3.46
60 years: 2003-2062	11.89	12.99	-1.09	-8.43	-3.85
65 years: 2003-2067	11.87	13.14	-1.27	-9.63	-4.23
70 years: 2003-2072	11.86	13.28	-1.42	-10.70	-4.62
75 years: 2003-2077	11.85	13.41	-1.56	-11.65	-5.00
DI:					
10 years: 2003-2012	2.22	2.02	.20	9.93	.00
15 years: 2003-2017	2.10	2.01	.09	4.41	-.38
20 years: 2003-2022	2.04	2.03	.01	.42	-.77
25 years: 2003-2027	2.01	2.08	-.07	-3.24	-1.15
30 years: 2003-2032	1.99	2.11	-.12	-5.76	-1.54
35 years: 2003-2037	1.97	2.14	-.16	-7.61	-1.92
40 years: 2003-2042	1.96	2.16	-.20	-9.21	-2.31
45 years: 2003-2047	1.96	2.19	-.23	-10.68	-2.69
50 years: 2003-2052	1.95	2.21	-.26	-11.92	-3.08
55 years: 2003-2057	1.94	2.23	-.29	-12.91	-3.46
60 years: 2003-2062	1.94	2.25	-.31	-13.69	-3.85
65 years: 2003-2067	1.94	2.26	-.33	-14.37	-4.23
70 years: 2003-2072	1.93	2.28	-.34	-14.97	-4.62
75 years: 2003-2077	1.93	2.29	-.35	-15.50	-5.00
OASDI:					
10 years: 2003-2012	16.08	12.02	4.06	33.79	.00
15 years: 2003-2017	15.07	12.12	2.96	24.40	-.38
20 years: 2003-2022	14.60	12.55	2.05	16.32	-.77
25 years: 2003-2027	14.34	13.09	1.26	9.60	-1.15
30 years: 2003-2032	14.18	13.59	.59	4.34	-1.54
35 years: 2003-2037	14.07	14.01	.06	.43	-1.92
40 years: 2003-2042	13.99	14.34	-.35	-2.42	-2.31
45 years: 2003-2047	13.94	14.61	-.67	-4.60	-2.69
50 years: 2003-2052	13.89	14.84	-.95	-6.38	-3.08
55 years: 2003-2057	13.86	15.05	-1.19	-7.90	-3.46
60 years: 2003-2062	13.83	15.23	-1.40	-9.20	-3.85
65 years: 2003-2067	13.81	15.40	-1.59	-10.33	-4.23
70 years: 2003-2072	13.79	15.55	-1.76	-11.32	-4.62
75 years: 2003-2077	13.78	15.70	-1.92	-12.21	-5.00

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

Figure IV.B4.—Long-Range Test of Close Actuarial Balance
[Comparison of estimated long-range actuarial balances with the minimum allowable for close actuarial balance under intermediate assumptions]



7. Income and Cost Rates by Component

Annual income rates and their components are shown in table IV.B10 for each alternative set of assumptions. The annual income rates reflect the scheduled payroll tax rates and the projected income from the taxation of benefits expressed as a percentage of taxable payroll. (Increasing income from taxation of benefits reflects rising benefit and income levels and the fact that benefit-taxation threshold amounts are not indexed.)

Summarized income and cost rates, along with their components, are presented in table IV.B11 for 25-year, 50-year, and 75-year valuation periods. Summarized income rates include the starting trust fund balance in addition to the components included in the annual income rates. The summarized cost rates include the cost of reaching a target trust fund of 100 percent of annual cost at the end of the period in addition to the cost included in the annual cost rates.

It may be noted that the payroll tax income expressed as a percentage of taxable payroll is slightly smaller than the actual tax rates in effect for each period. This results from the fact that all OASDI income and cost amounts presented in this report are computed on a cash basis, i.e., amounts are attributed to the year in which they are actually received by, or expended (payable) from, the fund, while taxable payroll is allocated to the year in which

earnings are paid. Because earnings are paid to workers before the corresponding payroll taxes are credited to the funds, payroll tax income for a particular year reflects a combination of the taxable payrolls from that year and from prior years, when payroll was smaller. Dividing payroll tax income by taxable payroll for a particular year, or period of years, will thus generally result in an income rate that is slightly less than the applicable tax rate for the period.

Table IV.B10.—Components of Annual Income Rates, Calendar Years 2003-80
[As a percentage of taxable payroll]

	OASI			DI			Combined		
Calendar year	Payroll tax rate	Taxation of benefits	Total	Payroll tax rate	Taxation of benefits	Total	Payroll tax rate	Taxation of benefits	Total
Intermediate:									
2003	10.60	0.28	10.88	1.80	0.02	1.82	12.40	0.30	12.70
2004	10.60	.27	10.87	1.80	.02	1.82	12.40	.29	12.69
2005	10.60	.28	10.88	1.80	.02	1.82	12.40	.30	12.70
2006	10.60	.28	10.88	1.80	.02	1.82	12.40	.30	12.70
2007	10.60	.29	10.89	1.80	.02	1.82	12.40	.32	12.72
2008	10.60	.31	10.91	1.80	.03	1.83	12.40	.33	12.73
2009	10.60	.32	10.92	1.80	.03	1.83	12.40	.34	12.74
2010	10.60	.33	10.93	1.80	.03	1.83	12.40	.36	12.76
2011	10.60	.37	10.97	1.80	.03	1.83	12.40	.40	12.80
2012	10.60	.39	10.99	1.80	.04	1.84	12.40	.42	12.82
2015	10.60	.44	11.04	1.80	.04	1.84	12.40	.48	12.88
2020	10.60	.54	11.14	1.80	.05	1.85	12.40	.59	12.99
2025	10.60	.64	11.24	1.80	.05	1.85	12.40	.69	13.09
2030	10.60	.72	11.32	1.80	.06	1.86	12.40	.78	13.18
2035	10.60	.77	11.37	1.80	.06	1.86	12.40	.83	13.23
2040	10.60	.79	11.39	1.80	.06	1.86	12.40	.86	13.26
2045	10.60	.81	11.41	1.80	.07	1.87	12.40	.87	13.27
2050	10.60	.83	11.43	1.80	.07	1.87	12.40	.90	13.30
2055	10.60	.86	11.46	1.80	.07	1.87	12.40	.92	13.32
2060	10.60	.88	11.48	1.80	.07	1.87	12.40	.95	13.35
2065	10.60	.90	11.50	1.80	.07	1.87	12.40	.97	13.37
2070	10.60	.92	11.52	1.80	.07	1.87	12.40	.99	13.39
2075	10.60	.94	11.54	1.80	.07	1.87	12.40	1.01	13.41
2080	10.60	.95	11.55	1.80	.07	1.87	12.40	1.03	13.43

Table IV.B10.—Components of Annual Income Rates, Calendar Years 2003-80 (Cont.)
[As a percentage of taxable payroll]

	OASI			DI			Combined		
Calendar year	Payroll tax rate	Taxation of benefits	Total	Payroll tax rate	Taxation of benefits	Total	Payroll tax rate	Taxation of benefits	Total
Low Cost:									
2003	10.60	0.28	10.88	1.80	0.02	1.82	12.40	0.30	12.70
2004	10.60	.27	10.87	1.80	.02	1.82	12.40	.29	12.69
2005	10.60	.27	10.87	1.80	.02	1.82	12.40	.30	12.70
2006	10.60	.27	10.87	1.80	.02	1.82	12.40	.30	12.70
2007	10.60	.28	10.88	1.80	.02	1.82	12.40	.31	12.71
2008	10.60	.29	10.89	1.80	.02	1.82	12.40	.32	12.72
2009	10.60	.30	10.90	1.80	.02	1.82	12.40	.33	12.73
2010	10.60	.31	10.91	1.80	.03	1.83	12.40	.34	12.74
2011	10.60	.35	10.95	1.80	.03	1.83	12.40	.38	12.78
2012	10.60	.36	10.96	1.80	.03	1.83	12.40	.39	12.79
2015	10.60	.40	11.00	1.80	.03	1.83	12.40	.43	12.83
2020	10.60	.48	11.08	1.80	.04	1.84	12.40	.52	12.92
2025	10.60	.56	11.16	1.80	.04	1.84	12.40	.60	13.00
2030	10.60	.62	11.22	1.80	.04	1.84	12.40	.66	13.06
2035	10.60	.65	11.25	1.80	.04	1.84	12.40	.69	13.09
2040	10.60	.66	11.26	1.80	.05	1.85	12.40	.70	13.10
2045	10.60	.66	11.26	1.80	.05	1.85	12.40	.70	13.10
2050	10.60	.66	11.26	1.80	.05	1.85	12.40	.71	13.11
2055	10.60	.67	11.27	1.80	.05	1.85	12.40	.72	13.12
2060	10.60	.68	11.28	1.80	.05	1.85	12.40	.72	13.12
2065	10.60	.67	11.27	1.80	.05	1.85	12.40	.72	13.12
2070	10.60	.67	11.27	1.80	.05	1.85	12.40	.72	13.12
2075	10.60	.67	11.27	1.80	.05	1.85	12.40	.72	13.12
2080	10.60	.68	11.28	1.80	.05	1.85	12.40	.73	13.13
High Cost:									
2003	10.60	.29	10.89	1.80	.02	1.82	12.40	.31	12.71
2004	10.60	.28	10.88	1.80	.02	1.82	12.40	.30	12.70
2005	10.60	.28	10.88	1.80	.03	1.83	12.40	.31	12.71
2006	10.60	.29	10.89	1.80	.03	1.83	12.40	.32	12.72
2007	10.60	.31	10.91	1.80	.03	1.83	12.40	.34	12.74
2008	10.60	.32	10.92	1.80	.03	1.83	12.40	.36	12.76
2009	10.60	.34	10.94	1.80	.03	1.83	12.40	.37	12.77
2010	10.60	.36	10.96	1.80	.04	1.84	12.40	.39	12.79
2011	10.60	.40	11.00	1.80	.04	1.84	12.40	.44	12.84
2012	10.60	.42	11.02	1.80	.05	1.85	12.40	.46	12.86
2015	10.60	.49	11.09	1.80	.05	1.85	12.40	.55	12.95
2020	10.60	.61	11.21	1.80	.06	1.86	12.40	.67	13.07
2025	10.60	.73	11.33	1.80	.07	1.87	12.40	.80	13.20
2030	10.60	.83	11.43	1.80	.07	1.87	12.40	.91	13.31
2035	10.60	.91	11.51	1.80	.08	1.88	12.40	.99	13.39
2040	10.60	.96	11.56	1.80	.08	1.88	12.40	1.04	13.44
2045	10.60	1.00	11.60	1.80	.09	1.89	12.40	1.09	13.49
2050	10.60	1.05	11.65	1.80	.09	1.89	12.40	1.14	13.54
2055	10.60	1.11	11.71	1.80	.10	1.90	12.40	1.20	13.60
2060	10.60	1.17	11.77	1.80	.10	1.90	12.40	1.26	13.66
2065	10.60	1.22	11.82	1.80	.10	1.90	12.40	1.32	13.72
2070	10.60	1.28	11.88	1.80	.10	1.90	12.40	1.38	13.78
2075	10.60	1.34	11.94	1.80	.10	1.90	12.40	1.44	13.84
2080	10.60	1.39	11.99	1.80	.10	1.90	12.40	1.49	13.89

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

Table IV.B11.—Components of Summarized Income Rates and Cost Rates, Calendar Years 2003-77
[As a percentage of taxable payroll]

Valuation period	Income rate: Payroll tax	Income rate: Taxation of benefits	Income rate: Beginning fund balance	Income rate: Total	Cost rate: Disbursements	Cost rate: Ending fund balance	Cost rate: Total
OASI:							
Intermediate:							
2003-27	10.59	0.43	1.31	12.33	10.53	0.48	11.01
2003-52	10.59	.57	.77	11.94	12.41	.21	12.63
2003-77	10.59	.64	.61	11.85	13.29	.12	13.41
Low Cost:							
2003-27	10.59	.40	1.29	12.28	9.79	.42	10.21
2003-52	10.59	.50	.77	11.86	11.02	.17	11.19
2003-77	10.59	.54	.60	11.73	11.36	.09	11.45
High Cost:							
2003-27	10.59	.48	1.31	12.38	11.43	.55	11.98
2003-52	10.59	.67	.77	12.03	14.17	.28	14.44
2003-77	10.59	.79	.60	11.99	15.90	.17	16.07
DI:							
Intermediate:							
2003-27	1.80	.04	.17	2.01	2.00	.08	2.08
2003-52	1.80	.05	.10	1.95	2.18	.03	2.21
2003-77	1.80	.05	.08	1.93	2.27	.02	2.29
Low Cost:							
2003-27	1.80	.03	.17	2.00	1.70	.06	1.76
2003-52	1.80	.04	.10	1.94	1.75	.03	1.77
2003-77	1.80	.04	.08	1.92	1.76	.01	1.78
High Cost:							
2003-27	1.80	.05	.17	2.02	2.37	.10	2.47
2003-52	1.80	.06	.10	1.96	2.71	.05	2.76
2003-77	1.80	.07	.08	1.95	2.90	.03	2.93
OASDI:							
Intermediate:							
2003-27	12.39	.47	1.48	14.34	12.53	.56	13.09
2003-52	12.39	.62	.88	13.89	14.59	.25	14.84
2003-77	12.39	.70	.69	13.78	15.56	.14	15.70
Low Cost:							
2003-27	12.39	.43	1.47	14.28	11.50	.48	11.98
2003-52	12.39	.54	.87	13.80	12.77	.20	12.97
2003-77	12.39	.58	.67	13.65	13.12	.11	13.23
High Cost:							
2003-27	12.39	.53	1.48	14.40	13.80	.65	14.45
2003-52	12.39	.74	.87	14.00	16.87	.33	17.20
2003-77	12.39	.86	.68	13.93	18.80	.20	19.00

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

8. Reasons for Change in Actuarial Balance From Last Report

Reasons for changes from last year's report to this report in the long-range actuarial balance under the intermediate assumptions are itemized in table IV.B12. Also shown are the estimated effects associated with each reason for change.

Table IV.B12.—Reasons for Change in the 75-Year Actuarial Balance Under Intermediate Assumptions
[As a percentage of taxable payroll]

Item	OASI	DI	Combined
Shown in last year's report:			
Income rate	11.79	1.92	13.72
Cost rate	13.33	2.26	15.59
Actuarial balance	-1.54	-.34	-1.87
Changes in actuarial balance due to changes in:			
Legislation / Regulation	.00	.00	.00
Valuation period[1]	-.06	-.01	-.07
Demographic data and assumptions	-.03	-.01	-.04
Economic data and assumptions	+.01	-.01	.00
Disability data and assumptions	.00	.00	.00
Programmatic data and methods	+.05	+.01	+.06
Total change in actuarial balance	-.03	-.02	-.04
Shown in this report:			
Actuarial balance	-1.56	-.35	-1.92
Income rate	11.85	1.93	13.78
Cost rate	13.41	2.29	15.70

[1] In changing from the valuation period of last year's report, which was 2002-76, to the valuation period of this report, 2003-77, the relatively large negative annual balance for 2077 is included. This results in a larger long-range actuarial deficit. The fund balance at the end of 2002, i.e., at the beginning of the projection period, is included in the 75-year actuarial balance.

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

No legislative changes have been enacted since the last report that directly affect the financing of the Social Security program (see section III.B).

In changing from the valuation period of last year's report, which was 2002-76, to the valuation period of this report, 2003-77, the relatively large negative annual balance for 2077 is included. This results in a larger long-range actuarial deficit. (Note that the fund balance at the end of 2002, i.e., at the beginning of the projection period, is included in the 75-year actuarial balance.)

Ultimate demographic assumptions are unchanged from last year's report. However, the starting population was updated based on tabulations from the 2000 Census, resulting in a substantially larger population and far more other-than-legal residents. As the new census indicated a far larger than previously estimated rate of other-than-legal immigration since 1990, this assumption was increased for the first 20 years of the projection period. Fertility rates were revised downward for recent years and at the start of the projection period, also due to the larger than expected census. In addition, mortality rates at ages under 65 were revised downward slightly for recent years and for the entire projection period due to the larger than expected census. However, mortality rates at ages 65 and over for the year 2000 were replaced with slightly higher final estimates (based on data unrelated to the census), resulting in slightly higher rates throughout the projection period. In

total, these updates to demographic data and assumptions resulted in an increase in the actuarial deficit of about 0.04 percent of taxable payroll.

Two ultimate economic assumptions were changed from those used in last year's report. First, the price differential, defined as the annual percent change in the Gross Domestic Product (GDP) deflator less the annual percent change in the CPI, was changed from -0.2 to -0.3, based on new research by the Bureau of Labor Statistics. Second, the average annual percent change in average hours worked was increased from -0.1 percent to 0.0 percent, based on historical trends. The change in the price differential reduces the real-wage differential by 0.1 percent, while the increase in average hours worked increases the real-wage differential by 0.1 percent. Thus, compared to last year's report, these two changes to the ultimate economic assumptions have no net effect on the real-wage differential and, therefore, the 75-year actuarial balance.

Two additional changes in economic assumptions are important. First, the Bureau of Economic Analysis revised downward its estimate of historical aggregate wages by about 3.0 percent for 2001 and 4.0 percent for 2002. Reflecting this revision substantially reduces OASDI tax income throughout the projection period but affects benefit levels with a significant delay, only for newly eligible individuals in the future. The net effect of this revision is thus an increase in the long-range actuarial deficit. Second, starting with the 2003 report, labor force participation rates are projected to increase with life expectancy. This change increases the projected size of the labor force by nearly 2.0 percent by the end of the 75-year period and significantly reduces the long-range actuarial deficit. However, these two changes tend to cancel and have a negligible net effect (i.e., less that 0.005 percent of taxable payroll) on the 75-year actuarial balance.

Two significant changes affect disability assumptions. First, the ultimate disability incidence rates were lowered somewhat from the levels used in last year's report in order to bring the rates closer to the average experience of the last 30 years. Second, rates of improvement used to project long-range death rates were increased to be more consistent with assumed improvement in overall mortality. The net effect of these two changes roughly offset each other, resulting in about the same disability prevalence rate and thus having very little effect on projected cost.

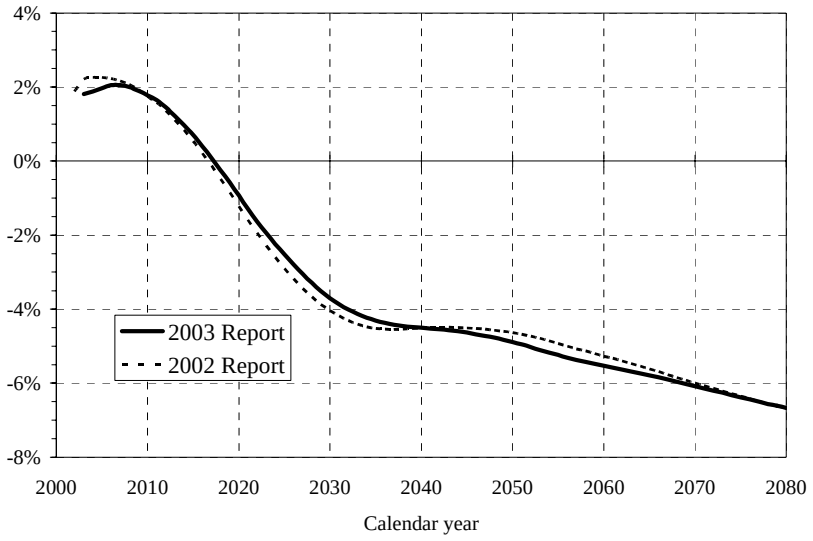
Several methodological improvements and updates of program-specific data were made for projections in the 2003 report. First, an updated sample of new beneficiaries was used for projecting long-range average benefit levels. Second, short-range projections were modified to reflect more of a delay in the average age at entitlement to benefits for retired workers as a result of the increasing normal retirement age (NRA). This change significantly reduced the number of beneficiaries, and thus the cost of the program in the early pro-

jection years. Together these changes result in a decrease in the actuarial deficit of 0.06 percent of taxable payroll.

If no changes in assumptions or methods were made for this report and actual experience had met expectations since the last report, the OASDI actuarial deficit would still be increased by 0.07 percent of taxable payroll from the level estimated for last year's report due to the change in the valuation period (see table IV.B12). However, changes were made in data, assumptions, and methods for this report. The net effect of these changes is to offset a portion of the increase in the deficit due to the new valuation period. This is indicated by the total 0.04-percent increase in the deficit, which, after rounding, raises the deficit from 1.87 percent to 1.92 percent of payroll.

The effects of changes made in this report can also be illustrated by comparing the annual (cash-flow) balances for this and the prior year's report. Figure IV.B5 provides this comparison for the combined OASDI program over the long range.

Figure IV.B5.—OASDI Annual Balances: 2002 and 2003 Reports
[As a percentage of taxable payroll under the intermediate assumptions]



The annual balance is lower, for this report, early in the projection period due to revisions in national earnings data for 2001 and 2002. Higher annual balances from about 2010 to 2040 reflect the increases in other-than-legal immigration since 1990, reflected in the 2000 Census, and the assumption for this report of higher annual immigration through 2022. The higher levels of immigration for 1990 through 2022 result in additional beneficiaries which cause a reduction in the annual balances from about 2040 to 2075.

V. ASSUMPTIONS AND METHODS UNDERLYING ACTUARIAL ESTIMATES

The future income and cost of the OASDI program will depend on many demographic, economic, and program-specific factors. Trust fund income will depend on how these factors affect the size and composition of the working population and the level and distribution of earnings. Similarly, program cost will depend on how these factors affect the size and composition of the beneficiary population and the general level of benefits.

Basic assumptions are developed for several of these factors based on analysis of historical trends and conditions, and on expected future conditions. These include fertility, mortality, immigration, marriage, divorce, productivity, inflation, average earnings, unemployment, retirement, and disability incidence and termination. Other factors are projected using methods that reflect historical and expected future relationships to the basic assumptions. These include total population, life expectancy, labor force, gross domestic product, interest rates, and a myriad of program-specific factors. It should be noted that all factors included in any consistent set of assumptions are interrelated directly or indirectly. It is also important to note that these interrelationships can and do change over time.

The assumptions and methods used in this report are reexamined each year in light of recent experience and new information about future conditions, and are revised if warranted.

Because projections of these factors and their interrelationships are inherently uncertain, estimates are shown in this report on the basis of three plausible sets of assumptions, designated as intermediate (alternative II), low cost (alternative I), and high cost (alternative III). The intermediate set represents the Board's best estimate of the future course of the population and the economy. In terms of the net effect on the status of the OASDI program, the low cost is the most optimistic, and the high cost is the most pessimistic.

Although these three sets of demographic and economic assumptions have been developed using the best available information, the resulting estimates should be interpreted with care. The estimates are not intended to be specific predictions of the future financial status of the OASDI program, but rather, they are intended to be indicators of the expected trend and a reasonable range of future income and cost, under a variety of plausible demographic and economic conditions.

The values for each of the demographic, economic, and program-specific factors are assumed to move from recently experienced levels or trends,

toward long-range ultimate values over the next 5 to 30 years. The ultimate values assumed after the first 5 to 30 years for both the demographic and the economic factors are intended to represent average experience or growth rates. Actual future values will exhibit fluctuations or cyclical patterns, as in the past.

The following sections discuss in abbreviated form the various assumptions and methods required to make the estimates of trust fund financial status which are the heart of this report.[1] There are, of course, many interrelationships among these factors that make a sequential presentation somewhat misleading. Nevertheless, the following sections roughly follow the order used in building the trust fund estimates presented in chapter IV.

A. DEMOGRAPHIC ASSUMPTIONS AND METHODS

The principal demographic assumptions relating to fertility, mortality, and net immigration for the three alternatives are shown in table V.A1. The rationales for selecting these assumptions are discussed in the following three sections.

1. Fertility Assumptions

Fertility (birth rate) assumptions are developed by single year of age, from 14 to 49. They are applied to the total number of women in the population at each age, for all marital statuses.

Historically, fertility rates in the United States have fluctuated widely. The total fertility rate[2] 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. After 1976, the total fertility rate began to rise again, reaching a level of 2.06 for 1991. Since then, the total fertility rate has remained fairly stable.

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[1] Further details about the assumptions, methods, and actuarial estimates are contained in Actuarial Studies published by the Office of the Chief Actuary, Social Security Administration. A complete list of available studies may be found on the Internet at http://www.ssa.gov/OACT/NOTES/actstud.html. To obtain copies of such Studies, or of this report, submit a request via our Internet request form; or write to: Office of the Chief Actuary, 700 Altmeyer Building, 6401 Security Boulevard, Baltimore, MD 21235; or call (410) 965-3015. This entire report, along with supplemental year-by-year tables, may also be found at http://www.ssa.gov/OACT/TR/TR03/index.html.

[2] 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 childbearing period. A rate of 2.1 would ultimately result in a nearly constant population if net immigration were zero and if death rates were constant.

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 relatively low fertility rate. These trends include the rising percentages of women who have never married, of women who are divorced, and of young women who are in the labor force. Based on consideration of these factors, ultimate total fertility rates of 2.2, 1.95, and 1.7 children per woman were selected for the low cost, intermediate, and high cost assumptions, respectively. For each alternative, the total fertility rate is assumed to gradually trend from the estimated level of 2.05 for 2001, reaching the selected ultimate level for 2027 and later.

The ultimate total fertility rates are unchanged from those in last year's report. However, total fertility rates for the historical period since 1991 and for about the first 20 years of the projection period are lower than those in last year's report due to revisions in the underlying birth rates. Birth rates are computed by dividing the reported number of births by the estimated population of women based on the most recent census. The recently available 2000 Census showed a significantly higher population than the Census Bureau had earlier estimated. This higher census count required an increase in the number of women of child-bearing age after 1990, resulting in a revision downward in historical birth rates back to 1991. These lower recent birth rates cause the projected birth rates to start from a lower level, and to remain at lower levels through about 2025.

2. Mortality Assumptions

Mortality (death rate) assumptions are developed by single year of age, sex, and cause of death.

Over the last century, death rates in the United States have declined substantially, but at varying rates. Historical rates (for years 1900-2000) used in preparing this report were calculated for ages below 65 (and for all ages prior to 1968) using data from the National Center for Health Statistics (NCHS).[1] For ages 65 and over, Medicare final data were used for years 1968 through 2000. Also used are death rates by cause of death produced by the NCHS for years 1979-2000.

[1] These rates reflect NCHS data on deaths and Census estimates of population.

The total age-sex-adjusted death rate[1] declined at an average rate[2] of 1.19 percent per year between 1900 and 2000. Between 1979 and 2000, the period for which death rates are analyzed by cause, the total age-sex-adjusted death rate (for all causes combined) declined at an average rate of 0.77 percent per year.

Historical death rates have declined more slowly for older ages than for the rest of the population. The age-sex-adjusted death rate for ages 65 and over declined at an average rate of 0.84 percent per year between 1900 and 2000. Between 1979 and 2000 the age-sex-adjusted death rate for these ages declined at an average annual rate of 0.55 percent.

Reductions in death rates have resulted from many factors, including increased medical knowledge and availability of health-care services, and improvements in sanitation and nutrition. Based on consideration of the expected rate of future 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 2027 and later. The intermediate set, which is used for alternative II, is considered to be the most likely to occur. The average annual percentage reductions used for alternative I are generally smaller than those for alternative II, while those used for alternative III are generally greater.

After 2000, the reductions in central death rates for alternative II are assumed to change rapidly from the average annual reductions by age, sex, and cause of death observed between 1979 and 2000, to the ultimate annual percentage reductions by age, sex, and cause of death assumed for 2027 and later. The reductions in death rates under alternatives I and III are also assumed to change rapidly to their ultimate levels, but start from levels which are, respectively, 50 or 150 percent of the average annual reductions observed between 1979 and 2000.

Projections of age-sex-adjusted death rates are presented in table V.A1 for the total (all ages), for under age 65, and for ages 65 and over. Under the intermediate assumptions, projected age-adjusted death rates for the total are slightly lower than those death rates in last year's report, until 2077, when the projected death rate equals that in last year's report. New data for 2000 and 2001 resulted in age-sex adjusted death rates throughout the projection

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[1] Calculated here as the crude rate that would occur in the enumerated total population as of April 1, 1990, if that population were to experience the death rates by age and sex for the selected year.

[2] Average rate of decline is calculated as the complement of the exponential of the slope of the least-squares line through the logarithms of the central death rates.

period that are lower than those in last year's report for the age group under 65 and are higher than those in last year's report for the age group 65 and over.

After adjustment for changes in the age-sex distribution of the population, the resulting total death rates are projected to decline at ultimate average annual rates of about 0.34 percent, 0.73 percent, and 1.27 percent between 2027 and 2077 for alternatives I, II, and III, respectively. In keeping with the patterns observed in the historical data, future rates of decline are assumed to be greater for younger ages than for older ages, but to a lesser degree than in the past. Accordingly, age-sex-adjusted death rates for ages 65 and over are projected to decline at average annual rates of about 0.30 percent, 0.69 percent, and 1.22 percent between 2027 and 2077 for alternatives I, II, and III, respectively.

There is a wide range of opinion among experts on the likely rate of future decline in death rates. For example, the 1999 Technical Panel on Assumptions and Methods appointed by the Social Security Advisory Board believed that ultimate rates of decline in mortality will be higher than the rates of decline assumed for the intermediate projections in this report. Others believe that biological and social factors may slow future rates of decline in mortality. Evolving mortality trends and developments in health care and life style will be closely monitored to determine what further modifications to the assumed ultimate rates of decline in mortality may be warranted for future reports.

3. Immigration Assumptions

Legal immigration increased after World War II to around 300,000 persons per year and remained around that level until shortly after 1960. With the Immigration Act of 1965 and other related changes, annual legal immigration increased to about 400,000 and remained fairly stable until 1977. Between 1977 and 1990, legal immigration once again increased, averaging about 580,000[1] per year. The Immigration Act of 1990, which took effect in fiscal year 1992, restructured the immigration categories and increased significantly the number of immigrants who may legally enter the United States. Legal immigration averaged about 810,000[1] persons per year during the period 1992 through 2001. The number of legal immigrants in 2001 is estimated to be 1,064,000 persons.

[1] Excludes those persons admitted under the Immigration Reform and Control Act of 1986.

For 2001, net legal immigration (after considering emigration) is estimated to be about 800,000 persons. Net other-than-legal immigration is estimated to be 400,000 persons, an increase of 100,000 persons over the level estimated for 2001 in last year's report. This increase in other-than-legal immigration is based on the 2000 Census counts that indicate a level in excess of 400,000 per year over the period 1990-2000. For 2002, net legal immigration is estimated to be 825,000 persons for the intermediate and low cost assumptions and 750,000 persons for the high cost assumptions. Net other-than-legal immigration for 2002 is estimated to be 400,000 persons for all three assumptions.

After 2002, the annual number of net legal immigrants is projected to reach an ultimate level around 2011. The ultimate level of annual net other-than-legal immigrants is projected to be reached in 2023 under the intermediate and low cost assumptions and in 2013 under the high cost assumptions. For the intermediate assumptions, the ultimate levels are the same as those in last year's report. However, prior to 2023, the total levels of net annual immigration (legal and other-than-legal) are higher than those in last year's report.

The total level of net immigration (legal and other-than-legal, combined) under the intermediate projection is assumed to be 900,000 persons[1] in 2023 and for each year afterward. For the low cost assumptions, net immigration is assumed to decline from a level of 1,430,000 persons in 2003 to an ultimate level of 1,300,000 persons[2] for each year 2023 and later. Under the high cost assumptions, net immigration is assumed to be 950,000 persons in 2003, and 672,500 persons[3] for each year after 2013.

[1] 600,000 net legal immigrants plus 300,000 net other-than-legal immigrants.

[2] 850,000 net legal immigrants plus 450,000 net other-than-legal immigrants.

[3] 472,500 net legal immigrants plus 200,000 net other-than-legal immigrants.

Table V.A1.—Principal Demographic Assumptions, Calendar Years 1940-2080

Calendar year	Total fertility rate[1]	Age-sex-adjusted death rate[2] per 100,000, by age			Net immigration	
		Total	Under 65	65 and over	Legal[3]	Other-than-legal[4]
Historical data:						
1940	2.23	1,672.6	656.1	8,791.1		
1945	2.42	1,488.6	584.4	7,820.1		
1950	3.03	1,339.9	480.0	7,361.7	170,594	
1955	3.50	1,243.0	424.7	6,973.6	209,779	
1960	3.61	1,237.9	418.8	6,973.1	201,276	
1965	2.88	1,210.8	411.7	6,806.6	232,400	
1970	2.43	1,138.4	403.7	6,283.5	278,928	
1975	1.77	1,020.9	352.5	5,701.7	294,303	
1980	1.82	961.1	316.8	5,473.1	410,348	
1985	1.84	912.3	289.9	5,270.4	433,449	
1990	2.07	865.9	277.6	4,985.5	501,065	
1991	2.06	854.1	274.4	4,913.5	548,000	
1992	2.04	842.5	268.4	4,862.5	620,986	
1993	2.02	861.8	271.4	4,996.0	644,696	
1994	2.00	850.2	268.7	4,922.3	583,390	
1995	1.98	847.4	265.3	4,923.8	573,719	
1996	1.98	834.1	254.3	4,894.0	662,284	
1997	1.97	819.2	242.3	4,858.9	571,800	
1998	2.00	812.2	235.7	4,849.5	489,360	
1999	2.01	816.4	233.6	4,897.8	523,037	
2000[5]	2.06	810.3	234.7	4,841.4	677,579	400,000
2001[5]	2.05	804.2	229.2	4,830.8	798,243	400,000
2002[5]	2.04	800.0	226.5	4,816.3	825,000	400,000
Intermediate:						
2005	2.03	786.6	218.8	4,763.0	750,000	400,000
2010	2.01	758.1	207.8	4,612.0	625,000	400,000
2015	2.00	727.3	197.8	4,435.2	600,000	350,000
2020	1.98	697.1	188.6	4,258.2	600,000	350,000
2025	1.96	668.5	180.0	4,089.1	600,000	300,000
2030	1.95	641.5	172.0	3,929.5	600,000	300,000
2035	1.95	616.2	164.4	3,780.2	600,000	300,000
2040	1.95	592.6	157.4	3,640.5	600,000	300,000
2045	1.95	570.4	150.7	3,509.6	600,000	300,000
2050	1.95	549.6	144.5	3,386.9	600,000	300,000
2055	1.95	530.1	138.6	3,271.6	600,000	300,000
2060	1.95	511.7	133.0	3,163.2	600,000	300,000
2065	1.95	494.3	127.8	3,061.1	600,000	300,000
2070	1.95	478.0	122.8	2,964.8	600,000	300,000
2075	1.95	462.5	118.2	2,873.9	600,000	300,000
2080	1.95	447.9	113.7	2,788.0	600,000	300,000

Table V.A1.—Principal Demographic Assumptions, Calendar Years 1940-2080 (Cont.)

Calendar year	Total fertility rate[1]	Age-sex-adjusted death rate[2] per 100,000, by age			Net immigration	
		Total	Under 65	65 and over	Legal[3]	Other-than-legal[4]
Low Cost:						
2005	2.06	802.2	223.5	4,854.6	925,000	550,000
2010	2.09	795.0	217.9	4,836.6	875,000	550,000
2015	2.13	782.3	212.1	4,775.2	850,000	500,000
2020	2.16	768.0	206.3	4,700.8	850,000	500,000
2025	2.19	753.5	200.8	4,624.1	850,000	450,000
2030	2.20	739.4	195.5	4,547.9	850,000	450,000
2035	2.20	725.7	190.4	4,474.3	850,000	450,000
2040	2.20	712.6	185.5	4,403.3	850,000	450,000
2045	2.20	700.0	180.9	4,334.9	850,000	450,000
2050	2.20	687.8	176.5	4,268.9	850,000	450,000
2055	2.20	676.2	172.2	4,205.2	850,000	450,000
2060	2.20	664.9	168.1	4,143.8	850,000	450,000
2065	2.20	654.1	164.2	4,084.5	850,000	450,000
2070	2.20	643.6	160.4	4,027.3	850,000	450,000
2075	2.20	633.5	156.8	3,972.0	850,000	450,000
2080	2.20	623.8	153.3	3,918.6	850,000	450,000
High Cost:						
2005	2.00	770.9	213.9	4,671.2	600,000	250,000
2010	1.93	719.5	196.0	4,384.9	472,500	250,000
2015	1.87	669.0	180.3	4,090.5	472,500	200,000
2020	1.80	621.7	166.2	3,811.3	472,500	200,000
2025	1.73	578.3	153.4	3,553.5	472,500	200,000
2030	1.70	538.5	141.7	3,317.1	472,500	200,000
2035	1.70	502.2	131.1	3,101.4	472,500	200,000
2040	1.70	469.1	121.3	2,904.4	472,500	200,000
2045	1.70	438.8	112.4	2,724.3	472,500	200,000
2050	1.70	411.1	104.3	2,559.3	472,500	200,000
2055	1.70	385.6	96.8	2,408.1	472,500	200,000
2060	1.70	362.3	90.0	2,269.3	472,500	200,000
2065	1.70	340.8	83.7	2,141.6	472,500	200,000
2070	1.70	321.1	77.9	2,024.1	472,500	200,000
2075	1.70	302.8	72.5	1,915.7	472,500	200,000
2080	1.70	286.0	67.6	1,815.6	472,500	200,000

[1] 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 were to experience the birth rates by age observed in, or assumed for, the selected year, and if she were to survive the entire childbearing period. The ultimate total fertility rate is assumed to be reached in 2027.

[2] The age-sex-adjusted death rate is the crude rate that would occur in the enumerated total population as of April 1, 1990, if that population were to experience the death rates by age and sex observed in, or assumed for, the selected year.

[3] Historical estimates of net legal immigration assume a 25 percent reduction in legal immigration due to legal emigration. Estimates do not include persons legalized under the Immigration Reform and Control Act of 1986.

[4] Other-than-legal net annual immigration is estimated to have been between 225,000 and 550,000 persons for years 1980 through 1999.

[5] Preliminary or estimated.

4. Total Population Estimates

Combining the above assumptions for future fertility, mortality, and net immigration with assumptions on marriage and divorce based on data from NCHS, projections were made of the population in the Social Security area

by age, sex, and marital status as of January 1 of each year 2001 through 2080. The starting Social Security area population for January 1, 2000, uses as a basis the Census Bureau's estimate of the residents of the 50 States and D.C., and U.S. Armed Forces overseas. This base estimate is significantly higher than the estimate for January 1, 2000 in last year's report because this estimate has been revised to reflect the higher than expected 2000 Census counts. The base estimate is adjusted for net census undercount and increased for other U.S. citizens living abroad (including residents of U.S. territories) and for non-citizens living abroad who are insured for Social Security benefits. This starting population was then projected using assumed rates of birth, death, marriage and divorce, and assumed levels of net immigration.

Table V.A2 shows the projected population as of July 1 by broad age group, for the three alternatives. Also shown are tabulated aged and total dependency ratios (see table footnotes for definitions).

Table V.A2.—Social Security Area Population as of July 1 and Dependency Ratios, Calendar Years 1950-2080

	Population (in thousands)				Dependency ratio	
Calendar year	Under 20	20-64	65 and over	Total	Aged[1]	Total[2]
Historical data:						
1950	54,468	92,901	12,812	160,180	0.138	0.724
1960	73,076	99,859	17,279	190,215	.173	.905
1965	80,134	104,833	19,093	204,059	.182	.947
1970	80,685	113,194	20,921	214,800	.185	.898
1975	78,438	122,862	23,266	224,566	.189	.828
1980	74,570	134,431	26,149	235,150	.195	.749
1985	73,248	144,897	29,065	247,210	.201	.706
1990	75,326	153,060	32,022	260,408	.209	.701
1995	80,486	161,290	34,572	276,348	.214	.713
2000	83,492	171,657	35,866	291,015	.209	.695
Intermediate:						
2005	84,733	183,015	37,145	304,894	.203	.666
2010	85,453	192,316	40,368	318,137	.210	.654
2015	86,417	197,711	46,608	330,736	.236	.673
2020	88,412	199,937	54,299	342,649	.272	.714
2025	89,423	201,035	63,014	353,471	.313	.758
2030	89,980	202,326	70,494	362,801	.348	.793
2035	90,332	205,682	74,843	370,856	.364	.803
2040	90,879	209,566	77,360	377,804	.369	.803
2045	91,688	213,052	79,142	383,883	.371	.802
2050	92,701	214,909	81,799	389,409	.381	.812
2055	93,578	216,295	84,894	394,768	.392	.825
2060	94,246	218,032	87,945	400,223	.403	.836
2065	94,844	220,848	90,108	405,800	.408	.837
2070	95,527	222,958	92,829	411,314	.416	.845
2075	96,316	224,829	95,447	416,592	.425	.853
2080	97,137	226,409	98,071	421,617	.433	.862

Table V.A2.—Social Security Area Population as of July 1 and Dependency Ratios, Calendar Years 1950-2080 (Cont.)

Calendar year	Population (in thousands)				Dependency ratio	
	Under 20	20-64	65 and over	Total	Aged[1]	Total[2]
Low Cost:						
2005	85,054	183,433	37,113	305,599	0.202	0.666
2010	87,001	194,023	40,149	321,173	.207	.655
2015	89,849	200,817	46,059	336,726	.229	.677
2020	94,364	204,519	53,283	352,166	.261	.722
2025	98,468	207,242	61,362	367,072	.296	.771
2030	102,239	210,742	68,044	381,026	.323	.808
2035	105,564	216,953	71,528	394,044	.330	.816
2040	109,000	224,262	73,263	406,525	.327	.813
2045	112,724	231,679	74,509	418,913	.322	.808
2050	116,703	237,989	76,894	431,586	.323	.813
2055	120,790	244,188	79,852	444,830	.327	.822
2060	124,745	251,265	82,755	458,764	.329	.826
2065	128,597	260,028	84,682	473,307	.326	.820
2070	132,511	268,683	87,086	488,280	.324	.817
2075	136,593	277,234	89,774	503,602	.324	.817
2080	140,809	285,501	93,001	519,311	.326	.819
High Cost:						
2005	84,385	182,525	37,172	304,081	.204	.666
2010	84,014	190,846	40,611	315,471	.213	.653
2015	83,317	195,317	47,259	325,893	.242	.669
2020	83,082	196,587	55,554	335,223	.283	.705
2025	81,415	196,667	65,106	343,188	.331	.745
2030	79,319	196,462	73,658	349,438	.375	.779
2035	77,330	197,738	79,204	354,272	.401	.792
2040	75,724	199,033	82,900	357,656	.417	.797
2045	74,491	199,465	85,680	359,636	.430	.803
2050	73,546	197,819	89,099	360,464	.450	.822
2055	72,339	195,444	92,807	360,591	.475	.845
2060	70,931	193,026	96,450	360,407	.500	.867
2065	69,560	191,241	99,260	360,061	.519	.883
2070	68,381	188,317	102,719	359,418	.545	.909
2075	67,360	185,229	105,673	358,262	.570	.934
2080	66,388	182,039	108,088	356,515	.594	.958

[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.

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

5. Life Expectancy Estimates

Life expectancy, or average remaining number of years expected prior to death, is a useful analytical concept. Life expectancy is calculated in two different forms, for two separate purposes.

Period life expectancy is calculated for a given year using the actual or expected death rates at each age for that year. It is a useful summary statistic for illustrating the overall level of the death rates experienced in a single year. It is thus closely related to the age-sex-adjusted death rate that is dis-

cussed in section V.A.2. Period life expectancy for a particular year may be viewed as the expected remaining life at a selected age *only* if it is assumed that there is no change in death rates after that year.

Cohort life expectancy truly answers the question "What is the expected average remaining lifetime for an individual at a selected age in a given year?" Cohort life expectancies are calculated using death rates not from a single year, but from the series of years in which the individual will actually reach each succeeding age if he or she survives.

Tables V.A3 and V.A4 present historical and projected life expectancies calculated on both period and cohort bases. Cohort life expectancies are somewhat greater than period life expectancies for the same year. This is because death rates for any given age tend to decline as time passes and the cohort grows older.

Table V.A3.—Period Life Expectancies[1]

Calendar year	Low Cost				Intermediate				High Cost			
	At birth		At age 65		At birth		At age 65		At birth		At age 65	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Historical data:												
1940					61.4	65.7	11.9	13.4				
1945					62.9	68.4	12.6	14.4				
1950					65.6	71.1	12.8	15.1				
1955					66.7	72.8	13.1	15.6				
1960					66.7	73.2	12.9	15.9				
1965					66.8	73.8	12.9	16.3				
1970					67.2	74.9	13.1	17.1				
1975					68.7	76.6	13.7	18.0				
1980					69.9	77.5	14.0	18.4				
1985					71.1	78.2	14.4	18.6				
1990					71.8	78.9	15.0	19.0				
1991					72.0	79.0	15.1	19.1				
1992					72.2	79.2	15.2	19.2				
1993					72.0	78.9	15.1	19.0				
1994					72.3	79.0	15.3	19.0				
1995					72.5	79.0	15.3	19.0				
1996					72.9	79.2	15.4	19.0				
1997					73.4	79.3	15.5	19.1				
1998					73.7	79.4	15.6	19.0				
1999					73.8	79.3	15.7	18.9				
2000[2] . . .					73.9	79.2	15.8	18.9				
2001[2] . . .					74.1	79.4	15.8	19.0				
2002[2] . . .					74.2	79.5	15.9	19.0				
Projected:												
2005	74.3	79.4	15.9	18.9	74.6	79.6	16.1	19.0	74.9	79.9	16.2	19.2
2010	74.6	79.5	16.0	18.9	75.2	80.0	16.4	19.3	75.8	80.6	16.8	19.7
2015	74.9	79.7	16.2	19.0	75.7	80.5	16.7	19.6	76.8	81.4	17.3	20.2
2020	75.2	79.9	16.3	19.1	76.3	80.9	17.0	19.9	77.7	82.2	17.9	20.8
2025	75.4	80.2	16.4	19.2	76.8	81.4	17.3	20.2	78.5	82.9	18.4	21.3
2030	75.7	80.4	16.5	19.3	77.3	81.8	17.7	20.5	79.4	83.6	19.0	21.8
2035	76.0	80.6	16.7	19.5	77.8	82.2	18.0	20.8	80.2	84.3	19.5	22.4
2040	76.2	80.8	16.8	19.6	78.3	82.6	18.3	21.1	80.9	85.0	20.1	22.9
2045	76.5	81.0	16.9	19.7	78.7	83.0	18.5	21.4	81.7	85.7	20.6	23.4
2050	76.7	81.2	17.0	19.8	79.2	83.4	18.8	21.7	82.4	86.3	21.1	23.9
2055	76.9	81.4	17.1	20.0	79.6	83.8	19.1	21.9	83.1	87.0	21.6	24.3
2060	77.2	81.6	17.2	20.1	80.0	84.2	19.4	22.2	83.8	87.6	22.1	24.8
2065	77.4	81.7	17.4	20.2	80.5	84.5	19.6	22.5	84.5	88.1	22.5	25.3
2070	77.6	81.9	17.5	20.3	80.8	84.9	19.9	22.7	85.1	88.7	23.0	25.7
2075	77.8	82.1	17.6	20.4	81.2	85.2	20.2	23.0	85.7	89.3	23.4	26.2
2080	78.0	82.2	17.7	20.5	81.6	85.5	20.4	23.2	86.3	89.8	23.9	26.6

[1] The period life expectancy at a given age for a given year represents the average number of years of life remaining if a group of persons at that age were to experience the mortality rates for that year over the course of their remaining lives.

[2] Preliminary or estimated.

Table V.A4.—Cohort Life Expectancies[1]

Calendar year	Low Cost				Intermediate				High Cost			
	At birth		At age 65[2]		At birth		At age 65[2]		At birth		At age 65[2]	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1940	69.0	75.3	12.7	14.7	69.4	75.9	12.7	14.7	70.0	76.6	12.7	14.7
1945	70.5	76.6	13.0	15.4	71.1	77.4	13.0	15.4	71.9	78.4	13.0	15.4
1950	71.4	77.6	13.1	16.2	72.3	78.6	13.1	16.2	73.4	79.9	13.1	16.2
1955	72.0	78.0	13.1	16.7	73.1	79.3	13.1	16.7	74.5	80.8	13.1	16.7
1960	72.4	78.3	13.2	17.4	73.7	79.8	13.2	17.4	75.5	81.6	13.2	17.4
1965	73.0	78.7	13.5	18.0	74.6	80.3	13.5	18.0	76.6	82.5	13.5	18.0
1970	73.8	79.3	13.8	18.5	75.7	81.1	13.8	18.5	78.1	83.6	13.8	18.5
1975	74.5	79.8	14.2	18.7	76.6	81.9	14.2	18.7	79.3	84.7	14.2	18.7
1980	75.1	80.2	14.7	18.7	77.5	82.5	14.7	18.8	80.6	85.6	14.7	18.8
1985	75.6	80.6	15.1	18.8	78.2	83.1	15.2	18.9	81.6	86.5	15.2	19.0
1990	76.0	80.9	15.5	18.8	78.8	83.6	15.6	19.1	82.6	87.3	15.7	19.3
1991	76.1	80.9	15.6	18.9	78.9	83.7	15.7	19.1	82.8	87.5	15.8	19.3
1992	76.2	81.0	15.6	18.9	79.0	83.8	15.8	19.1	83.0	87.6	15.9	19.4
1993	76.2	81.0	15.7	18.9	79.1	83.9	15.9	19.2	83.2	87.8	16.0	19.5
1994	76.3	81.1	15.7	18.9	79.3	84.0	15.9	19.2	83.4	87.9	16.2	19.6
1995	76.4	81.2	15.8	18.9	79.4	84.1	16.0	19.3	83.6	88.1	16.3	19.6
1996	76.5	81.2	15.9	18.9	79.5	84.2	16.1	19.3	83.7	88.2	16.4	19.7
1997	76.5	81.3	15.9	18.9	79.6	84.2	16.2	19.4	83.9	88.4	16.5	19.8
1998	76.6	81.3	16.0	19.0	79.7	84.3	16.3	19.4	84.1	88.5	16.7	19.9
1999	76.6	81.3	16.0	19.0	79.8	84.4	16.4	19.5	84.2	88.6	16.8	20.0
2000	76.6	81.3	16.1	19.0	79.9	84.4	16.5	19.5	84.3	88.7	16.9	20.1
2001	76.7	81.4	16.1	19.0	80.0	84.6	16.5	19.6	84.5	88.9	17.0	20.2
2002	76.8	81.5	16.1	19.0	80.1	84.6	16.6	19.6	84.7	89.0	17.2	20.3
2005	76.9	81.6	16.2	19.1	80.4	84.9	16.8	19.8	85.2	89.5	17.5	20.7
2010	77.2	81.8	16.3	19.2	80.9	85.3	17.1	20.1	86.0	90.1	18.1	21.2
2015	77.4	82.0	16.5	19.3	81.3	85.6	17.5	20.5	86.7	90.7	18.7	21.8
2020	77.7	82.2	16.6	19.5	81.7	86.0	17.8	20.8	87.4	91.3	19.3	22.4
2025	77.9	82.4	16.7	19.6	82.1	86.3	18.1	21.1	88.0	91.9	19.9	23.0
2030	78.1	82.5	16.8	19.7	82.5	86.6	18.4	21.4	88.6	92.4	20.5	23.5
2035	78.3	82.7	16.9	19.8	82.9	87.0	18.7	21.7	89.3	92.9	21.0	24.1
2040	78.6	82.9	17.1	19.9	83.3	87.3	19.0	22.0	89.9	93.5	21.6	24.6
2045	78.8	83.0	17.2	20.1	83.6	87.6	19.3	22.3	90.4	94.0	22.1	25.1
2050	78.9	83.2	17.3	20.2	84.0	87.9	19.6	22.5	91.0	94.5	22.6	25.6
2055	79.1	83.3	17.4	20.3	84.3	88.1	19.8	22.8	91.5	94.9	23.1	26.1
2060	79.3	83.5	17.5	20.4	84.6	88.4	20.1	23.0	92.1	95.4	23.6	26.5
2065	79.5	83.6	17.6	20.5	85.0	88.7	20.4	23.3	92.6	95.9	24.1	27.0
2070	79.7	83.7	17.7	20.6	85.3	89.0	20.6	23.5	93.1	96.3	24.6	27.5
2075	79.8	83.9	17.8	20.7	85.6	89.2	20.9	23.8	93.6	96.7	25.0	27.9
2080	80.0	84.0	17.9	20.8	85.9	89.5	21.1	24.0	94.3	97.2	25.5	28.3

[1]The cohort life expectancy at a given age for a given year represents the average number of years of life remaining if a group of persons at that age were to experience the mortality rates for the series of years in which they reach each succeeding age.

[2] Age 65 cohort life expectancies are based on actual data prior to 1970.

B. ECONOMIC ASSUMPTIONS AND METHODS

The basic economic assumptions are embodied in three alternatives that are designed to vary Social Security's financial status, and illustrate the likely range of outcomes that might be encountered. The intermediate assumptions reflect the Trustees' consensus expectation of moderate economic growth throughout the projection period. The low cost assumptions represent a more optimistic outlook, with relatively strong economic growth. The high cost assumptions represent a relatively pessimistic scenario, with weak economic growth and two recessions in the short-range period. Economic cycles are not included in the assumptions beyond the first 5 to 10 years of the projection period because they have little effect on the long-range estimates of financial status. Based on the latest estimates, the economy is assumed to be below its potential level of output and employment in the latter half of 2002.

This report also includes, for the first time, a stochastic projection that provides a probability distribution of possible future outcomes that is centered around the Trustees' intermediate assumptions. Additional economic assumptions and modeling are required for these projections. These are discussed in appendix E.

The following sections 1 through 4 discuss the principal economic assumptions for the three alternatives that are summarized in table V.B1. The subsequent sections 5 through 7 discuss additional economic factors, summarized in table V.B2, that are critical to the projections of the future financial status of the combined OASI and DI Trust Funds.

1. Productivity Assumptions

Total U.S. economy productivity is defined as the ratio of real gross domestic product (GDP) to hours worked by all workers.[1] The rate of change in total productivity is a major determinant in the growth of average earnings. For the 40 years from 1961 to 2001, annual increases in total productivity averaged 1.7 percent, the result of average annual increases of 2.7, 1.4, 1.3, and 1.5 percent for the 10-year periods 1961-71, 1971-81, 1981-91 and 1991-2001, respectively. The ultimate annual increases in productivity are assumed to be 1.9, 1.6, and 1.3 percent for the low cost, intermediate, and high cost assumptions, respectively. These are the same as the ultimate rates assumed for the 2002 report.

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[1] Historical levels of real GDP are from the Bureau of Economic Analysis' (BEA) National Income and Product Accounts (NIPA). Historical total hours worked is an unpublished series provided by the Bureau of Labor Statistics (BLS), and is for all civilian and military wage and salary workers and the self-employed.

For the intermediate assumptions, the annual change in productivity is assumed to decrease from 3.6 percent in 2002 to 1.9 percent for 2003, and to increase to 2.3 percent for 2004. This pattern reflects relatively slow economic growth assumed for the last quarter of 2002, followed by gradually accelerating economic growth through 2003. Thereafter, the annual change in productivity gradually decreases to the ultimate assumed level of 1.6 percent by 2011. For the low cost assumptions, the annual change in productivity decreases gradually from 3.6 percent in 2002 to the ultimate assumed level of 1.9 percent by 2010. For the high cost assumptions, the annual change in productivity decreases from 3.4 percent in 2002 to 1.1 percent for 2003. Thereafter, the annual change in productivity varies with the business cycle until reaching its ultimate growth rate of 1.3 percent for 2012.

2. Price Inflation Assumptions

Future changes in the Consumer Price Index for Urban Wage Earners and Clerical Workers (hereafter denoted as CPI) will directly affect the OASDI program through the automatic cost-of-living benefit increases. Future changes in the GDP chain-type price index (hereafter, the GDP deflator) affect the nominal levels of the GDP, wages, self-employment income, average earnings, and the taxable payroll.

Historically, the CPI has increased by an average of 4.5 percent for the 40 years from 1961 to 2001, the result of average annual increases of 3.1, 8.4, 3.9, and 2.6 percent for the 10-year periods 1961-71, 1971-81, 1981-91 and 1991-2001, respectively. The GDP deflator has increased by 4.0 percent for 1961 to 2001, and by 3.1, 7.4, 3.7, and 2.0 percent annually for the same respective 10-year periods. It should be noted that several methodological changes made by the Bureau of Labor Statistics in methods for computing the CPI since 1995 will tend to reduce the difference between the growth rates of these indices in the future.

The ultimate annual increases in the CPI are assumed to be 2.0, 3.0, and 4.0 percent for the low cost, intermediate, and high cost assumptions, respectively. For each alternative, the ultimate annual increase in the GDP deflator is assumed to be equal to the sum of the annual increases in the CPI and a -0.3 percentage point price differential. This differential is based primarily on methodological differences in the construction of the two indices. Hence, for the intermediate assumptions, the ultimate annual increase in the GDP deflator is 2.7 percent, the sum of the 3.0 percent assumed ultimate annual increase in the CPI and the -0.3 percentage point price differential. Similarly, the ultimate annual increases in the GDP deflator are 1.7 and 3.7 percent for

the low cost and high cost assumptions, respectively. The assumed ultimate annual rates of increase in the CPI are the same as those used in the 2002 report. The assumed ultimate annual rates of increase in the GDP deflator for each alternative are 0.1 percentage point lower than those used in the 2002 report. Hence, for all three alternatives, the price differential was changed from -0.2 percentage point in the 2002 report to -0.3 percentage point in the 2003 report. This change is based on new research by the BLS indicating that the effect of one of the methodological differences (i.e. an upper-level substitution bias embedded in the CPI measure only) is now expected to be 0.1 percentage point greater than previously estimated.

For the intermediate assumptions, the annual change in the CPI is assumed to increase from 1.4 percent for 2002 to 2.4 percent for 2003 and 2004. Thereafter, the annual change in the CPI increases gradually to the assumed ultimate rate of 3.0 percent as of 2007. For the low cost assumptions, the annual change in the CPI increases from 1.4 percent for 2002 to 2.2 percent for 2003, then decreases to the assumed ultimate rate of 2.0 percent for 2004. For the high cost assumptions, the annual change in the CPI increases from 1.4 percent for 2002 to 5.8 percent for 2006, and decreases to its assumed ultimate rate of 4.0 percent as of 2010. The price differential, defined as the percent change in the GDP deflator less the CPI percent change, is -0.3 percentage point in 2002. For all three alternatives, the price differential is projected to be -0.8 percentage point for 2003, -0.6 percentage point for 2004, and to move smoothly toward -0.3 percentage point as of 2009 and later.

3. Average Earnings Assumptions

The level of average (nominal) earnings in OASDI covered employment for each year has a direct effect on the size of the taxable payroll and on the future level of average benefits. In addition, increases in the level of average wages in the U.S. economy directly affect the indexation, under the automatic-adjustment provisions in the law, of the OASDI 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.

These concepts are closely linked to average U.S. earnings, defined as the ratio of the sum of total U.S. wage and salary disbursements and proprietor income to the sum of total U.S. military and total civilian (household) employment. The growth rates in average U.S. earnings can be broken down into the growth rates for total U.S. economy productivity and the GDP price index (see previous two sections), and the growth rates for other compo-

nents, including average hours worked, the ratio of earnings to compensation (which includes fringe benefits), and the ratio of compensation to GDP.

The average annual change in average hours worked was -0.1 percent over the last 40 years, and -0.4, -0.5, 0.0, and 0.4 percent for the 10-year periods 1961-71, 1971-81, 1981-91 and 1991-2001, respectively. Though the historical data by 10-year periods suggest that the trend growth rate in average hours worked may have shifted from negative to positive, other evidence indicates differently. Some of the recent increase in the average percent change in average hours worked is believed to be associated with changes in the distribution of employment by age/sex and by educational attainment. In the future, these distributions are expected to largely stabilize. Furthermore, the percent average annual change in average hours worked over the post-1990 period is expected to be revised downward when the BLS releases revised civilian employment data reflecting higher population levels associated with the 2000 Census. Finally, it is believed that workers will take part of their future gains in real earnings (due to the assumed growth in productivity) in increased leisure time, therefore reducing average hours worked.

However, the most recent data and analyses suggest a slightly stronger underlying move toward a less negative growth rate in average hours worked over the historical period. The BLS revisions to the Household Survey data are now known and indicate that the post-1990 percent average annual change in average hours worked, after adjusting for changes in the age-sex and educational distribution of the workforce, was positive. Furthermore, productivity was relatively high in the post-1990 period, suggesting a potentially less robust link between increases in real earnings and leisure. Consequently, for the 2003 report, the ultimate annual rates of change for average hours worked are assumed to be 0.1, 0.0, and -0.1 percent for the low cost, intermediate, and high cost assumptions, respectively. Compared to the 2002 report, these ultimate annual rates of change for average hours worked are 0.1 percentage point higher in all three alternatives.

The average annual change in the ratio of earnings to compensation was -0.2 percent from 1961 to 2001. The assumed ultimate annual rates of change are -0.1, -0.2, and -0.3 percent for the ratio of earnings to compensation, for the low cost, intermediate, and high cost assumptions, respectively. The ratio of compensation to GDP is assumed to be stable.

Thus, the ultimate projected annual growth rate in average U.S. earnings is about 4.1 percent for the intermediate assumptions. This reflects assumed ultimate annual growth rates of about 1.6, -0.2, 0.0, and 2.7 percent for productivity, the ratio of earnings to compensation, average hours worked, and

the GDP deflator, respectively. Similarly, the ultimate projected annual growth rate in average nominal U.S. earnings is 3.6 percent for the low cost assumptions and 4.6 percent for the high cost assumptions.

Over long periods of time the average annual growth rates in average U.S. earnings and average earnings in OASDI covered employment are expected to be very close to the average annual growth rates in the average wage in OASDI covered employment (henceforth the average covered wage). Thus, the assumed ultimate annual growth rates in the average covered wage are 3.6, 4.1, and 4.6 percent for the low cost, intermediate, and high cost assumptions, respectively. For the intermediate assumptions, the annual rate of change in the average covered wage is assumed to increase from the estimated 1.9 percent increase in 2002 to 3.9 percent for 2003, and to 4.4 percent for 2004, as the economy recovers. For 2005 and later, the annual rate of change in the average covered wage moves gradually to its assumed ultimate annual growth rate of 4.1 percent. (See table V.B1 for historical and assumed future values.)

While the assumed ultimate projected annual growth rates in the average wage in OASDI covered employment and in the average nominal U.S. earnings in the 2003 Trustees Report are the same as the assumed ultimate projected annual growth rates in last year's report, the levels in last year's report are significantly higher. This occurred because the Bureau of Economic Analysis (BEA) overestimated wages for 2001 and 2002 in its initial release of National Income and Product Accounts (NIPA) data. Subsequently, as part of its annual July 2002 revisions to the NIPA, the BEA lowered its previous estimate of the level of NIPA wage and salary disbursements by about 2.9 percent for 2001 and by 3.8 percent for the first quarter of 2002. Thus, for the 2002 Trustees Report, the projected annual level of wages was overestimated by 2.9 percent for 2001 and by about 4.0 percent for 2002, which was then carried forward as overestimates in the average wage in OASDI covered employment and in the average nominal U.S. earnings in 2003 and later.

4. Assumed Real-Wage Differentials

For simplicity, real increases in the average OASDI covered wage have traditionally been expressed in the form of real-wage differentials—i.e., the percentage change in the average covered wage minus the percentage change in the CPI. This differential is closely related to assumed growth rates in average earnings and productivity, which are discussed in the previous section. Over the 40-year period, 1962-2001, the real-wage differential averaged 1.2 percentage points, the result of averages of 1.8, -0.2, 1.0, and 1.8 percentage points for the 10-year periods 1962-71, 1972-81, 1982-91, and

1992-2001, respectively. The assumed ultimate annual average covered real-wage differentials are 1.6, 1.1, and 0.6 percentage point(s) for the low cost, intermediate, and high cost assumptions, respectively.

Based on preliminary data, the real-wage differential was 0.5 percentage point for 2002. For the intermediate assumptions, the real-wage differential is projected to rise to about 2.0 percentage points by 2004, as the economy recovers. The real-wage differential is projected to fall to 1.6 percentage points for 2005, 1.4 percentage points for 2006, and to the ultimate assumed differential of 1.1 percentage points (4.1 percent nominal wage growth less 3.0 percent CPI inflation) by 2012.

For the low cost assumptions, the real-wage differential is assumed to be in the range of 0.5 percentage point to 2.3 percentage points between 2002 and 2010, remaining at about the ultimate assumed real-wage differential of 1.6 percentage points thereafter. For the high cost assumptions, the real-wage differential for the short-range period is projected to fluctuate between -1.1 and 2.5 percentage points, eventually stabilizing at about 0.6 percentage point for 2011 and later.

Table V.B1.—Principal Economic Assumptions

Calendar year	Average annual percentage increase in—						Real-wage differ-ential[1]
	Productivity (Total U.S. economy)	Earnings as a percent of compensation	Average hours worked	GDP price index	Average annual wage in covered employment	Consumer Price Index[2]	
Historical data:							
1960 to 1965. . . .	3.4	-0.2	0.0	1.4	3.2	1.2	2.0
1965 to 1970. . . .	1.9	-.4	-.7	4.1	5.8	4.2	1.6
1970 to 1975. . . .	2.1	-.7	-.9	6.6	6.6	6.8	-.1
1975 to 1980. . . .	1.0	-.6	-.2	7.3	8.7	8.9	-.2
1980 to 1985. . . .	1.6	-.2	-.1	5.3	6.7	5.2	1.4
1985 to 1990. . . .	1.2	.0	.0	3.3	4.7	3.8	.9
1990 to 1995. . . .	1.1	-.1	.3	2.5	3.4	3.0	.4
1995 to 2000. . . .	2.0	.7	.4	1.7	5.6	2.4	3.2
1992	2.9	.2	-.4	2.4	4.9	2.9	2.0
1993	.3	-1.0	1.0	2.4	1.9	2.8	-.9
1994	1.1	-.4	.7	2.1	3.4	2.5	1.0
1995	.4	1.0	.9	2.2	4.0	2.9	1.1
1996	2.2	1.2	.0	1.9	4.4	2.9	1.5
1997	1.6	1.2	.6	1.9	5.9	2.3	3.6
1998	1.9	.4	.9	1.2	6.1	1.3	4.8
1999	2.1	.2	.5	1.4	5.5	2.2	3.3
2000	2.4	.3	.1	2.1	6.2	3.5	2.7
2001	.8	-.3	-.4	2.4	1.8	2.7	-.9
2002	3.6	-.5	-.5	1.1	1.9	1.4	.5
Intermediate:							
2003	1.9	-.1	-.1	1.6	3.9	2.4	1.5
2004	2.3	-.1	.0	1.8	4.4	2.4	2.0
2005	2.1	-.1	.0	2.2	4.3	2.7	1.6
2006	1.9	-.1	.0	2.5	4.3	2.9	1.4
2007	1.8	-.1	.0	2.6	4.4	3.0	1.4
2008	1.7	-.1	.0	2.6	4.3	3.0	1.3
2009	1.7	-.1	.0	2.7	4.3	3.0	1.3
2010	1.7	-.1	.0	2.7	4.2	3.0	1.2
2011	1.6	-.1	.0	2.7	4.2	3.0	1.2
2012	1.6	-.1	.0	2.7	4.1	3.0	1.1
2015	1.6	-.2	.0	2.7	4.1	3.0	1.1
2020	1.6	-.2	.0	2.7	4.1	3.0	1.1
2025	1.6	-.2	.0	2.7	4.1	3.0	1.1
2030	1.6	-.2	.0	2.7	4.1	3.0	1.1
2035	1.6	-.2	.0	2.7	4.1	3.0	1.1
2040	1.6	-.2	.0	2.7	4.1	3.0	1.1
2045	1.6	-.2	.0	2.7	4.1	3.0	1.1
2050	1.6	-.2	.0	2.7	4.1	3.0	1.1
2055	1.6	-.2	.0	2.7	4.1	3.0	1.1
2060	1.6	-.2	.0	2.7	4.1	3.0	1.1
2065	1.6	-.2	.0	2.7	4.1	3.0	1.1
2070	1.6	-.2	.0	2.7	4.1	3.0	1.1
2075	1.6	-.2	.0	2.7	4.1	3.0	1.1
2080	1.6	-.2	.0	2.7	4.1	3.0	1.1

Table V.B1.—Principal Economic Assumptions (Cont.)

Calendar year	Average annual percentage increase in— Productivity (Total U.S. economy)	Earnings as a percent of compensation	Average hours worked	GDP price index	Average annual wage in covered employment	Consumer Price Index[2]	Real-wage differential[1]
Low Cost:							
2003	2.4	0.0	-0.1	1.4	4.4	2.2	2.3
2004	2.4	-.1	.0	1.4	4.2	2.0	2.2
2005	2.2	.0	.0	1.5	3.9	2.0	1.9
2006	2.1	.0	.0	1.6	3.7	2.0	1.7
2007	2.1	.0	.1	1.6	3.8	2.0	1.8
2008	2.0	-.1	.1	1.6	3.7	2.0	1.7
2009	2.0	-.1	.1	1.7	3.7	2.0	1.7
2010	1.9	-.1	.1	1.7	3.7	2.0	1.7
2011	1.9	-.1	.1	1.7	3.7	2.0	1.7
2012	1.9	-.1	.1	1.7	3.6	2.0	1.6
2015	1.9	-.1	.1	1.7	3.6	2.0	1.6
2020	1.9	-.1	.1	1.7	3.6	2.0	1.6
2025	1.9	-.1	.1	1.7	3.6	2.0	1.6
2030	1.9	-.1	.1	1.7	3.6	2.0	1.6
2035	1.9	-.1	.1	1.7	3.6	2.0	1.6
2040	1.9	-.1	.1	1.7	3.6	2.0	1.6
2045	1.9	-.1	.1	1.7	3.6	2.0	1.6
2050	1.9	-.1	.1	1.7	3.6	2.0	1.6
2055	1.9	-.1	.1	1.7	3.6	2.0	1.6
2060	1.9	-.1	.1	1.7	3.6	2.0	1.6
2065	1.9	-.1	.1	1.7	3.6	2.0	1.6
2070	1.9	-.1	.1	1.7	3.6	2.0	1.6
2075	1.9	-.1	.1	1.7	3.6	2.0	1.6
2080	1.9	-.1	.1	1.7	3.6	2.0	1.6
High Cost:							
2003	1.1	-.2	-.1	1.8	2.5	2.5	.0
2004	2.7	-.1	-.1	2.4	5.5	3.0	2.5
2005	1.7	-.2	-.1	4.0	5.8	4.5	1.3
2006	.1	-.3	-.1	5.4	4.8	5.8	-1.1
2007	1.9	-.3	-.1	5.4	6.2	5.8	.4
2008	2.0	-.2	-.1	4.5	6.9	4.9	2.0
2009	1.2	-.3	-.1	3.8	5.0	4.1	.9
2010	1.2	-.2	-.1	3.7	4.5	4.0	.5
2011	1.2	-.2	-.1	3.7	4.6	4.0	.6
2012	1.3	-.2	-.1	3.7	4.6	4.0	.6
2015	1.3	-.3	-.1	3.7	4.6	4.0	.6
2020	1.3	-.3	-.1	3.7	4.6	4.0	.6
2025	1.3	-.3	-.1	3.7	4.6	4.0	.6
2030	1.3	-.3	-.1	3.7	4.6	4.0	.6
2035	1.3	-.3	-.1	3.7	4.6	4.0	.6
2040	1.3	-.3	-.1	3.7	4.6	4.0	.6
2045	1.3	-.3	-.1	3.7	4.6	4.0	.6
2050	1.3	-.3	-.1	3.7	4.6	4.0	.6
2055	1.3	-.3	-.1	3.7	4.6	4.0	.6
2060	1.3	-.3	-.1	3.7	4.6	4.0	.6
2065	1.3	-.3	-.1	3.7	4.6	4.0	.6
2070	1.3	-.3	-.1	3.7	4.6	4.0	.6
2075	1.3	-.3	-.1	3.7	4.6	4.0	.6
2080	1.3	-.3	-.1	3.7	4.6	4.0	.6

[1] The real-wage differential is the difference between the percentage increases, before rounding, in the average annual wage in covered employment, and the average annual Consumer Price Index.

[2] The Consumer Price Index is the annual average value for the calendar year of the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).

5. Labor Force and Unemployment Projections

The civilian labor force is projected by age, sex, marital status, and presence of children. Projections of the labor force participation rates for each subgroup take into account the percentages of the population that are disabled or in the military, the levels of Social Security retirement benefits, the state of the economy, and (starting with this report) changes in life expectancy. The projections also include a "lagged-cohort effect" that applies changes in participation rates for a cohort at a specific age (relative to earlier cohorts at the same age) to participation rates for that cohort at older ages.

The annual rate of growth in the size of the labor force decreased from an average of about 2.1 percent during the 1970s and 1980s to about 1.1 percent from 1990 to 2000. Further slowing of labor force growth is projected due to a substantial slowing of growth in the working age population in the future—a natural consequence of the baby-boom generation approaching retirement and the succeeding lower-birth-rate cohorts reaching working age. The projected slowdown in labor force growth also reflects a slowdown in the relatively rapid growth in older female labor force participation rates by about 2006. Under the intermediate assumptions, after 2001 the labor force is projected to increase by about 1.0 percent per year, on average, through 2012, and to increase much more slowly thereafter, ultimately reaching a 0.2 percent annual growth rate over the final third of the 75-year projection period.

The ultimate projected labor force participation rates are not basic assumptions. They are derived from a historically-based structural relationship using demographic and economic assumptions specific to each alternative. In past Trustees reports, because little variation in the structural relationship is assumed, and participation rates are not highly sensitive to most of the demographic and economic assumptions, the ultimate projected labor force participation rates vary only slightly into the future, and across alternatives. However, the projected participation rates for prime-age and older males and females are adjusted upward due to assumed increases in their life expectancies. By itself, this results in a total labor force that is about 1.8 percent higher by 2080.

For men, the projected age-adjusted labor force participation rates for 2080 are 74.4, 74.2, and 74.3 percent for the low cost, intermediate, and high cost assumptions, respectively, compared to the 2001 level of 74.3 percent. (Age-adjusted labor force participation rates are adjusted to the 2001 age distribution of the civilian noninstitutional U.S. population.) These are the net effect of increases due to assumed improvements in life expectancy, and decreases

due to higher assumed disability prevalence rates and an increasing proportion of males who are never married. For women, the projected age-adjusted labor force participation rates for 2080 are 61.1, 61.1, and 61.0 percent, for the low cost, intermediate, and high cost assumptions, respectively, compared to the 2001 level of 60.1 percent. These projections are the net effect of decreases due to higher assumed disability prevalence rates, increases due to assumed improvements in life expectancy, and increases due to assumed changes in the proportion of females who are never married, separated, widowed, or divorced.

The unemployment rate presented in table V.B2 is in the most commonly cited form, the civilian rate. For years through 2012, total rates are presented without adjustment for changes in the age-sex distribution of the population. For years after 2012, unemployment rates are presented as total age-sex adjusted rates (using the age-sex distribution of the 2001 civilian labor force). Age-sex adjusted rates allow for more meaningful comparisons across longer time periods.

The total unemployment rate reflects the projected levels of unemployment for various age-sex subgroups of the population. The unemployment rate for each subgroup is projected based on a specification (consistent with Okun's Law) relating changes in the unemployment rate to the changes in the business cycle, as measured by the ratio of the actual to potential GDP. For each alternative, the total unemployment rate is projected to move toward the ultimate assumed rate as the economy moves toward the long-range sustainable growth path.

The ultimate age-sex adjusted unemployment rate for each alternative is assumed to be reached by 2012. After 2012, the age-sex adjusted rate is stable because the ratio of actual to potential GDP is assumed to be constant. The ultimate assumed unemployment rates are 4.5, 5.5, and 6.5 percent for the low cost, intermediate, and high cost assumptions, respectively. These are the same values assumed in the 2002 report.

6. Gross Domestic Product Projections

The real growth rate in gross domestic product (GDP) equals the combined growth rates for total employment, productivity, and average hours worked. Total employment is the sum of the U.S. Armed Forces and total civilian employment, which is based on the projected total civilian labor force and unemployment rates. For the 40-year period from 1961 to 2001, the average growth rate in real GDP was 3.4 percent, combining the growth rates of 1.7,

1.7, and -0.1 percent for its components—total employment, productivity, and average hours worked, respectively.

For the intermediate assumptions, the average annual growth in real GDP is projected to be 2.9 percent over the short-range projection period (2003-12), a slower rate than the 3.4 percent average observed over the historical 40-year period (1961-2001). This slowdown is primarily due to slower projected growth in total employment. For the low cost assumptions, annual growth in real GDP is projected to average 3.4 percent over the decade ending in 2012. The relatively faster growth is due mostly to a higher assumed rate of growth in worker productivity. For the high cost assumptions, real GDP is assumed to fall in the fourth quarter of 2002 and in the first quarter of 2003, resulting in a total decline in real GDP of 0.9 percent. After 12 quarters of recovery, a second recession, with a total decline in real GDP of 1.5 percent, is assumed to begin in the second quarter of 2006 and last 3 quarters. After the second recession, a moderate economic recovery is assumed through 2009, with continued modest economic growth thereafter. For the high cost assumptions, annual growth in real GDP is projected to average 2.1 percent for the decade ending in 2012.

After 2012, no economic cycles are assumed for the three alternatives. Thus, projected rates of growth in real GDP are determined by the projected full-employment rate of growth for total employment, and the assumed full-employment rates of growth for total U.S. economy productivity and average hours worked. For the intermediate assumptions, the projected rate of growth for real GDP falls toward the assumed productivity growth rate because of the projected decline in labor force growth over the period. By 2080, the growth in real GDP slows to about 1.8 percent, due to the assumed ultimate percent changes of 0.2, 1.6, and 0.0 for total employment, productivity, and average hours worked, respectively. In last year's report, real GDP growth was 1.6 percent by 2080, due to the assumed ultimate percent changes of 0.2, 1.6, and -0.1 for total employment, productivity, and average hours worked, respectively.

7. Interest Rate Projections

The interest rate presented in table V.B2 for each year is the average of the nominal interest rates for special U.S. Government obligations issuable to the trust funds in each of the 12 months of the year. Interest for these securities is generally compounded semiannually. The real interest rate (ex post) is defined to be the annual (compounded) yield rate for investments in these securities divided by the annual rate of growth in the CPI for the first year after issuance. For 2002, the average annual nominal interest rate for securi-

ties newly issued to the trust funds was 4.9 percent, a decrease of 0.3 percentage point from the average nominal interest rate of 5.2 percent for 2001.

In developing a reasonable range of assumed ultimate future real interest rates for the three alternatives, historical experience was examined for the 40 years, 1962-2001, and for each of the 10-year subperiods, 1962-71, 1972-81, 1982-91, and 1992-2001. For the 40-year period, the real interest rate averaged 3.3 percent per year. For the four 10-year subperiods, the real interest rates averaged 2.3, 0.2, 6.5 and 4.3 percent, respectively. The assumed ultimate real interest rates are 3.7 percent, 3.0 percent, and 2.2 percent for the low cost, intermediate, and high cost assumptions, respectively. The ultimate real yields are assumed to be reached by the end of the short-range period. These annual real yields are the same as those assumed in the 2002 report. These ultimate real interest rates, when combined with the ultimate CPI assumptions of 2.0, 3.0, and 4.0 percent, yield ultimate nominal interest rates of about 5.7 percent for the low cost assumptions, 6.0 percent for the intermediate assumptions, and about 6.2 percent for the high cost assumptions.

For the 10-year short-range projection period, nominal interest rates are projected based on changes in the business cycle and in the CPI. Under the intermediate assumptions, the nominal interest rate is projected to rise from 4.9 percent in 2002 to 6.4 percent in 2006, reflecting a recovering economy along with a higher rate of inflation. Thereafter, the nominal interest rate declines steadily to the ultimate assumed level of 6.0 percent in 2010. For the low cost assumptions, the average annual nominal interest rate is assumed to reach an ultimate level of about 5.7 percent in 2007. For the high cost assumptions, it is assumed to peak at 8.3 percent in 2007, and then decline to an ultimate rate of about 6.2 percent in 2011.

Table V.B2.—Additional Economic Factors

Calendar year	Average annual unemployment rate[1] (percent)	Average annual percentage increase in— Labor force[3]	Total employment[4]	Real GDP[5]	Average annual interest rate[2] (percent)
Historical data:					
1960 to 1965	5.5	1.3	1.6	5.0	4.0
1965 to 1970	3.9	2.2	2.1	3.4	5.9
1970 to 1975	6.1	2.5	1.5	2.7	6.7
1975 to 1980	6.8	2.7	2.9	3.7	8.5
1980 to 1985	8.3	1.5	1.5	3.1	12.1
1985 to 1990	5.9	1.7	2.0	3.2	8.5
1990 to 1995	6.6	1.0	.9	2.4	7.0
1995 to 2000	4.6	1.3	1.6	4.0	6.2
1992	7.5	1.4	.5	3.1	7.1
1993	6.9	.8	1.3	2.7	6.1
1994	6.1	1.4	2.2	4.0	7.1
1995	5.6	1.0	1.4	2.7	6.9
1996	5.4	1.2	1.4	3.6	6.6
1997	4.9	1.8	2.2	4.4	6.6
1998	4.5	1.0	1.4	4.3	5.6
1999	4.2	1.2	1.5	4.1	5.9
2000	4.0	1.1	1.2	3.8	6.2
2001	4.8	.7	-.1	.3	5.2
2002	5.8	.5	-.6	2.4	4.9
Intermediate:					
2003	6.0	1.3	1.1	2.9	5.1
2004	5.9	1.2	1.3	3.6	6.2
2005	5.7	1.2	1.4	3.5	6.3
2006	5.6	1.1	1.3	3.2	6.4
2007	5.5	1.1	1.1	3.0	6.3
2008	5.5	1.0	1.0	2.8	6.2
2009	5.5	.9	.9	2.6	6.1
2010	5.5	.8	.8	2.5	6.0
2011	5.4	.7	.7	2.4	6.0
2012	5.4	.6	.6	2.2	6.0
2015	5.5	.4	.4	2.0	6.0
2020	5.5	.3	.3	1.9	6.0
2025	5.5	.3	.3	1.9	6.0
2030	5.5	.3	.3	1.9	6.0
2035	5.5	.3	.3	1.9	6.0
2040	5.5	.3	.3	1.9	6.0
2045	5.5	.3	.3	1.8	6.0
2050	5.5	.2	.2	1.8	6.0
2055	5.5	.2	.2	1.8	6.0
2060	5.5	.2	.2	1.8	6.0
2065	5.5	.2	.2	1.8	6.0
2070	5.5	.2	.2	1.8	6.0
2075	5.5	.2	.2	1.8	6.0
2080	5.5	.2	.2	1.8	6.0

Table V.B2.—Additional Economic Factors (Cont.)

Calendar year	Average annual unemployment rate[1] (percent)	Average annual percentage increase in— Labor force[3]	Total employment[4]	Real GDP[5]	Average annual interest rate[2] (percent)
Low Cost:					
2003	5.7	1.4	1.5	3.8	5.4
2004	5.4	1.4	1.7	4.1	6.1
2005	5.1	1.3	1.6	3.8	5.9
2006	5.0	1.2	1.4	3.6	5.8
2007	4.9	1.2	1.3	3.5	5.7
2008	4.8	1.1	1.3	3.4	5.7
2009	4.6	1.0	1.2	3.3	5.7
2010	4.5	.9	1.1	3.1	5.7
2011	4.4	.9	.9	3.0	5.7
2012	4.4	.8	.8	2.8	5.7
2015	4.5	.6	.6	2.6	5.7
2020	4.5	.5	.5	2.5	5.7
2025	4.5	.4	.4	2.4	5.7
2030	4.5	.5	.5	2.5	5.7
2035	4.5	.6	.6	2.6	5.7
2040	4.5	.6	.6	2.6	5.7
2045	4.5	.6	.6	2.6	5.7
2050	4.5	.6	.6	2.6	5.7
2055	4.5	.6	.6	2.6	5.7
2060	4.5	.6	.6	2.6	5.7
2065	4.5	.7	.7	2.7	5.7
2070	4.5	.6	.6	2.6	5.7
2075	4.5	.6	.6	2.6	5.7
2080	4.5	.6	.6	2.6	5.7
High Cost:					
2003	6.7	1.0	.1	1.0	4.7
2004	6.4	1.0	1.3	3.9	7.0
2005	6.0	1.1	1.5	3.1	8.0
2006	6.5	.9	.4	.4	7.9
2007	7.2	.6	-.1	1.7	8.3
2008	6.5	1.0	1.7	3.7	8.2
2009	6.3	.9	1.1	2.2	6.7
2010	6.4	.7	.6	1.7	6.3
2011	6.4	.7	.6	1.7	6.2
2012	6.4	.5	.6	1.7	6.2
2015	6.5	.3	.3	1.5	6.2
2020	6.5	.2	.2	1.4	6.2
2025	6.5	.2	.2	1.4	6.2
2030	6.5	.2	.2	1.4	6.2
2035	6.5	.1	.1	1.3	6.2
2040	6.5	.0	.0	1.2	6.2
2045	6.5	-.1	-.1	1.1	6.2
2050	6.5	-.1	-.1	1.1	6.2
2055	6.5	-.2	-.2	1.0	6.2
2060	6.5	-.2	-.2	1.0	6.2
2065	6.5	-.2	-.2	.9	6.2
2070	6.5	-.3	-.3	.9	6.2
2075	6.5	-.3	-.3	.9	6.2
2080	6.5	-.3	-.3	.9	6.2

[1] Unadjusted civilian unemployment rates are shown through 2012. Thereafter, the rates are adjusted to the age-sex distribution of the civilian labor force in 2001.

[2] The average annual interest rate is the average of the nominal interest rates, which, in practice, are compounded semiannually, for special public-debt obligations issuable to the trust funds in each of the 12 months of the year.

[3] The U.S. civilian labor force concept is used here.

[4] Total of civilian and military employment in the U.S. economy.

[5] The real GDP (gross domestic product) is the value of total output of goods and services, expressed in 1996 dollars.

C. PROGRAM-SPECIFIC ASSUMPTIONS AND METHODS

The demographic and economic assumptions and methods described in the previous sections are used in a set of models to project future income and cost under the OASDI program. In some cases, the economic assumptions result in the direct calculation of program parameters as described in the following subsection. These parameters affect the level of payroll taxes collected and the level of benefits paid and are calculated using formulas described explicitly in the Social Security Act. In other cases, the combination of demographic and economic assumptions are used indirectly to drive more complicated models that project the numbers of future workers covered under OASDI and the levels of their covered earnings, and the numbers of future beneficiaries and the expected levels of their benefits. The following subsections provide brief descriptions of the derivations of these program-specific factors.

1. Automatically Adjusted Program Amounts

The Social Security Act specifies that certain program amounts affecting the determination of OASDI benefits are to be adjusted annually, in general, to reflect changes in the economy. The law prescribes specific formulas that, when applied to reported statistics, produce automatic revisions in these program amounts and hence in the benefit-computation procedures. These automatic adjustments are based upon measured changes in the national average wage index and the CPI.[1] In this section, values are shown for program amounts that are subject to automatic adjustment, from the time that such adjustments became effective through 2012. Projected values for future years are based on the economic assumptions described in the preceding section of this report.

The following two tables present the historical and projected values of the CPI-based benefit increases, as well as the average wage index series and the values of many of the wage-indexed program amounts. In each table, the projections are shown under the three alternative sets of economic assumptions described in the previous section. Table V.C1 includes:

- The annual percentage increases which have been applied to OASDI benefits under automatic cost-of-living adjustment provisions in the Social Security Act, based on increases in the CPI.

[1] Details of these indexation procedures are published annually in the *Federal Register*, and are also available on the Internet at http://www.ssa.gov/OACT/COLA/index.html.

- The annual levels of and percentage increases in the national average wage index. Under section 215(b)(3) of the Social Security Act, the national average wage index for each year after 1950 is used to index the taxable earnings of most workers first becoming eligible for benefits in 1979 or later. This procedure converts a worker's past earnings to approximately their equivalent values near the time of the worker's retirement or other eligibility, and these indexed values are used to calculate the worker's benefit. The average wage index is also used to adjust most of the other program amounts that are subject to the automatic-adjustment provisions.
- The OASDI contribution and benefit base—the maximum amount of earnings subject to the OASDI payroll tax in the specified year.
- The retirement earnings test exempt amounts—the annual amount of earnings below which beneficiaries are not subject to benefit withholding. A lower exempt amount applies in years before a beneficiary attains normal retirement age (NRA). A higher amount applies for the year in which the beneficiary attains normal retirement age. The retirement test does not apply beginning with the attainment of normal retirement age.

Table V.C1.—Cost-of-Living Benefit Increases, Average Wage Index, Contribution and Benefit Bases, and Retirement Earnings Test Exempt Amounts, 1975-2012

Calendar year	OASDI benefit increases[1] (percent)	Average wage index[2]		OASDI contribution and benefit base[3]	Retirement earnings test exempt amount	
		Amount	Increase (percent)		Under NRA[4]	At NRA[5]
Historical data:						
1975	8.0	$8,630.92	7.5	$14,100	$2,520	$2,520
1976	6.4	9,226.48	6.9	15,300	2,760	2,760
1977	5.9	9,779.44	6.0	16,500	3,000	3,000
1978	6.5	10,556.03	7.9	17,700	3,240	4,000
1979	9.9	11,479.46	8.7	22,900	3,480	4,500
1980	14.3	12,513.46	9.0	25,900	3,720	5,000
1981	11.2	13,773.10	10.1	29,700	4,080	5,500
1982	7.4	14,531.34	5.5	32,400	4,440	6,000
1983	3.5	15,239.24	4.9	35,700	4,920	6,600
1984	3.5	16,135.07	5.9	37,800	5,160	6,960
1985	3.1	16,822.51	4.3	39,600	5,400	7,320
1986	1.3	17,321.82	3.0	42,000	5,760	7,800
1987	4.2	18,426.51	6.4	43,800	6,000	8,160
1988	4.0	19,334.04	4.9	45,000	6,120	8,400
1989	4.7	20,099.55	4.0	48,000	6,480	8,880
1990	5.4	21,027.98	4.6	51,300	6,840	9,360
1991	3.7	21,811.60	3.7	53,400	7,080	9,720
1992	3.0	22,935.42	5.2	55,500	7,440	10,200
1993	2.6	23,132.67	.9	57,600	7,680	10,560
1994	2.8	23,753.53	2.7	60,600	8,040	11,160
1995	2.6	24,705.66	4.0	61,200	8,160	11,280
1996	2.9	25,913.90	4.9	62,700	8,280	12,500
1997	2.1	27,426.00	5.8	65,400	8,640	13,500
1998	1.3	28,861.44	5.2	68,400	9,120	14,500
1999	[6]2.5	30,469.84	5.6	72,600	9,600	15,500
2000	3.5	32,154.82	5.5	76,200	10,080	17,000
2001	2.6	32,921.92	2.4	80,400	10,680	25,000
Intermediate:						
2002	[7]1.4	33,476.75	1.7	[7]84,900	[7]11,280	30,000
2003	2.3	34,730.66	3.7	[7]87,000	[7]11,520	[7]30,720
2004	2.4	36,202.65	4.2	88,500	11,760	31,200
2005	2.8	37,733.96	4.2	91,800	12,120	32,400
2006	2.9	39,338.44	4.3	95,700	12,720	33,720
2007	3.0	41,033.61	4.3	99,600	13,200	35,160
2008	3.0	42,771.99	4.2	103,800	13,800	36,720
2009	3.0	44,566.15	4.2	108,300	14,400	38,280
2010	3.0	46,409.05	4.1	113,100	15,000	39,960
2011	3.0	48,325.83	4.1	117,900	15,600	41,520
2012	3.0	50,293.80	4.1	122,700	16,320	43,320
Low Cost:						
2002	[7]1.4	33,547.79	1.9	[7]84,900	[7]11,280	30,000
2003	2.0	34,907.44	4.1	[7]87,000	[7]11,520	[7]30,720
2004	2.0	36,337.05	4.1	88,500	11,760	31,320
2005	2.0	37,740.22	3.9	92,100	12,240	32,520
2006	2.0	39,121.33	3.7	96,000	12,720	33,960
2007	2.0	40,568.05	3.7	99,600	13,200	35,160
2008	2.0	42,055.17	3.7	103,500	13,680	36,480
2009	2.0	43,599.78	3.7	107,100	14,280	37,800
2010	2.0	45,172.07	3.6	111,000	14,760	39,240
2011	2.0	46,792.70	3.6	115,200	15,240	40,680
2012	2.0	48,448.46	3.5	119,400	15,840	42,120

Table V.C1.—Cost-of-Living Benefit Increases, Average Wage Index, Contribution and Benefit Bases, and Retirement Earnings Test Exempt Amounts, 1975-2012 (Cont.)

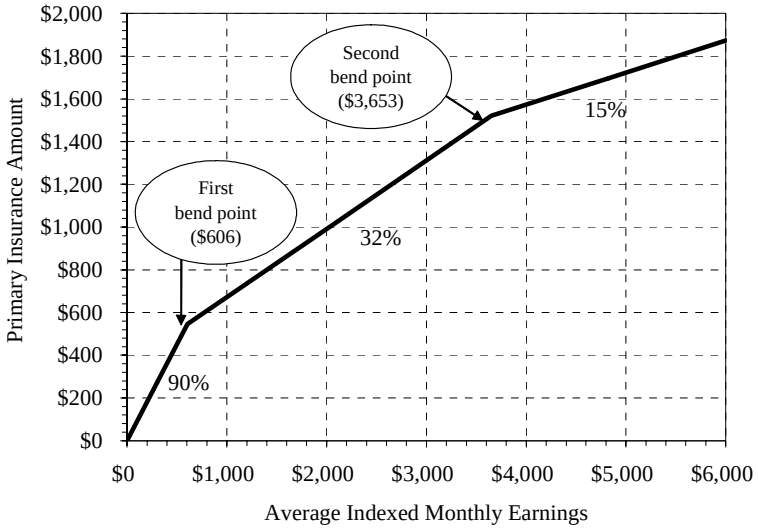
Calendar year	OASDI benefit increases[1] (percent)	Average wage index[2]		OASDI contribution and benefit base[3]	Retirement earnings test exempt amount	
		Amount	Increase (percent)		Under NRA[4]	At NRA[5]
High Cost:						
2002	[7]1.4	$33,417.83	1.5	[7]$84,900	[7]$11,280	$30,000
2003	2.5	34,208.13	2.4	[7]87,000	[7]11,520	[7]30,720
2004	3.1	36,009.40	5.3	88,200	11,760	31,200
2005	4.7	38,058.89	5.7	90,300	12,000	31,920
2006	6.0	39,853.26	4.7	95,100	12,600	33,600
2007	5.6	42,279.32	6.1	100,500	13,320	35,520
2008	4.8	45,170.39	6.8	105,300	13,920	37,200
2009	4.1	47,441.85	5.0	111,600	14,880	39,480
2010	4.0	49,588.16	4.5	119,400	15,840	42,120
2011	4.0	51,840.85	4.5	125,400	16,680	44,280
2012	4.0	54,216.93	4.6	131,100	17,400	46,320

[1] Effective with benefits payable for June in each year 1975-82, and for December in each year after 1982.
[2] See table VI.F7 for projected dollar amounts of the average wage index beyond 2012.
[3] Amounts for 1979-81 were specified by Public Law 95-216. The bases for years after 1989 were increased slightly by changes to the indexing procedure, as required by Public Law 101-239.
[4] Normal retirement age. See table V.C3 for specific values.
[5] In 1955-82, the retirement earnings test did not apply at ages 72 and over; in 1983-99, the test did not apply at ages 70 and over; beginning in 2000, it does not apply beginning with the month of attainment of NRA. In the year of attainment of NRA, the higher exempt amount applies to earnings in the year prior to the month of NRA attainment. Amounts for 1978-82 specified by Public Law 95-216; for 1996-2002, Public Law 104-121.
[6] Originally determined as 2.4 percent, but pursuant to Public Law 106-554, is effectively 2.5 percent.
[7] Actual amount, as determined under automatic-adjustment provisions.

Other wage-indexed amounts are shown in table V.C2. The table provides historical values from 1978, when the amount of earnings required for a quarter of coverage was first indexed, through 2003, and also shows projected amounts through 2012. These other wage-indexed program amounts are:

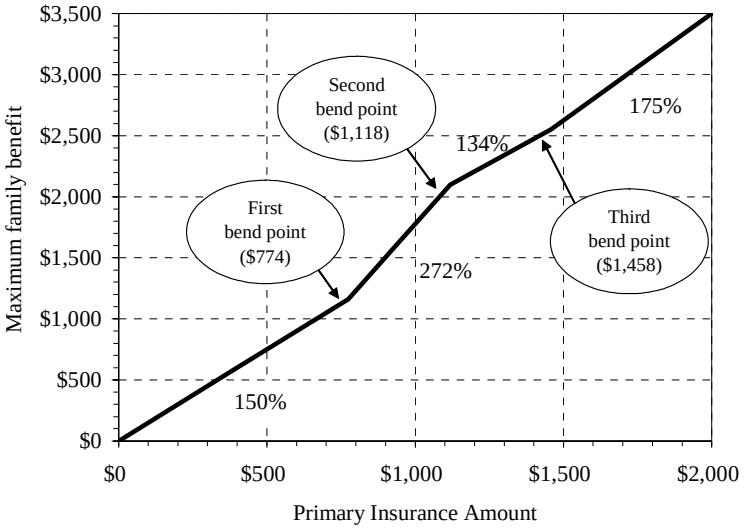
- The bend points in the formula for computing the primary insurance amount (PIA) for workers who reach age 62, become disabled, or die in a given year. These bend points indicate three ranges in a worker's average indexed monthly earnings (AIME) over which a certain percent factor, 90, 32, or 15 percent respectively, is applied to determine the worker's PIA. Figure V.C1 presents the PIA formula for 2003.

Figure V.C1.—Primary-Insurance-Amount Formula for the 2003 Cohort



- Bend points in the formula used to compute the maximum total amount of monthly benefits payable on the basis of the earnings of a retired or deceased worker. This formula is a function of the worker's PIA, and relies on four intervals and percentages. Figure V.C2 presents the maximum-family-benefit formula for 2003.

Figure V.C2.—Maximum-Family-Benefit Formula for the 2003 Cohort



- The amount of earnings required in a year to be credited with a quarter of coverage (QC). The number and timing of QCs earned is used to determine an individual's insured status—the basic requirement for benefit eligibility under OASDI.
- The old-law contribution and benefit base—the OASDI contribution and benefit base that would have been in effect in each year after 1978 under the automatic-adjustment provisions as in effect before the enactment of the 1977 amendments. This old-law base is used in determining special-minimum benefits for certain workers who have many years of low earnings in covered employment. Beginning in 1986, the old-law base is also used in the calculation of OASDI benefits for certain workers who are eligible to receive pensions based on noncovered employment. In addition, it is used for certain purposes under the Railroad Retirement program and the Employee Retirement Income Security Act of 1974.

Table V.C2.—Selected Wage-Indexed Program Amounts, Calendar Years 1978-2012

Calendar year	AIME bend points in PIA formula[1]		PIA bend points in maximum-family-benefit formula[2]			Earnings required for a quarter of coverage	Old-law contribution and benefit base[3]
	First	Second	First	Second	Third		
Historical data:							
1978	4/	4/	4/	4/	4/	[5] $250	4/
1979	[5] $180	[5] $1,085	[5] $230	[5] $332	[5] $433	260	$18,900
1980	194	1,171	248	358	467	290	20,400
1981	211	1,274	270	390	508	310	22,200
1982	230	1,388	294	425	554	340	24,300
1983	254	1,528	324	468	610	370	26,700
1984	267	1,612	342	493	643	390	28,200
1985	280	1,691	358	517	675	410	29,700
1986	297	1,790	379	548	714	440	31,500
1987	310	1,866	396	571	745	460	32,700
1988	319	1,922	407	588	767	470	33,600
1989	339	2,044	433	626	816	500	35,700
1990	356	2,145	455	656	856	520	38,100
1991	370	2,230	473	682	890	540	39,600
1992	387	2,333	495	714	931	570	41,400
1993	401	2,420	513	740	966	590	42,900
1994	422	2,545	539	779	1,016	620	45,000
1995	426	2,567	544	785	1,024	630	45,300
1996	437	2,635	559	806	1,052	640	46,500
1997	455	2,741	581	839	1,094	670	48,600
1998	477	2,875	609	880	1,147	700	50,700
1999	505	3,043	645	931	1,214	740	53,700
2000	531	3,202	679	980	1,278	780	56,700
2001	561	3,381	717	1,034	1,349	830	59,700
2002	592	3,567	756	1,092	1,424	870	63,000
2003	606	3,653	774	1,118	1,458	890	64,500

Table V.C2.—Selected Wage-Indexed Program Amounts, Calendar Years 1978-2012 (Cont.)

Calendar year	AIME bend points in PIA formula[1]		PIA bend points in maximum-family-benefit formula[2]			Earnings required for a quarter of coverage	Old-law contribution and benefit base[3]
	First	Second	First	Second	Third		
Intermediate:							
2004	$616	$3,714	$787	$1,136	$1,482	$910	$65,700
2005	639	3,853	817	1,179	1,538	940	68,100
2006	666	4,017	851	1,229	1,603	980	71,100
2007	695	4,186	887	1,281	1,671	1,020	74,100
2008	724	4,364	925	1,335	1,742	1,070	77,100
2009	755	4,553	965	1,393	1,817	1,110	80,400
2010	787	4,745	1,006	1,452	1,894	1,160	84,000
2011	820	4,944	1,048	1,513	1,973	1,210	87,300
2012	854	5,149	1,091	1,576	2,055	1,260	91,200
Low Cost:							
2004	617	3,722	789	1,139	1,485	910	65,700
2005	643	3,873	821	1,185	1,546	950	68,400
2006	669	4,031	855	1,234	1,609	980	71,400
2007	695	4,187	888	1,281	1,671	1,020	74,100
2008	720	4,340	920	1,328	1,732	1,060	76,800
2009	747	4,501	954	1,377	1,796	1,100	79,500
2010	774	4,666	989	1,428	1,862	1,140	82,500
2011	802	4,837	1,025	1,480	1,930	1,180	85,500
2012	831	5,012	1,062	1,534	2,000	1,220	88,500
High Cost:							
2004	615	3,708	786	1,134	1,480	910	65,700
2005	630	3,795	805	1,161	1,515	930	67,200
2006	663	3,995	847	1,222	1,594	980	70,800
2007	701	4,223	895	1,292	1,685	1,030	74,700
2008	734	4,422	937	1,353	1,765	1,080	78,300
2009	778	4,691	994	1,435	1,872	1,150	83,100
2010	831	5,012	1,062	1,533	2,000	1,220	88,500
2011	873	5,264	1,116	1,611	2,101	1,290	93,000
2012	913	5,502	1,166	1,683	2,196	1,340	97,200

[1] The formula to compute a PIA is (1) 90% of AIME below the first bend point, plus (2) 32% of AIME in excess of the first bend point but not in excess of the second, plus (3) 15% of AIME in excess of the second bend point. The bend points pertain to the first year a beneficiary becomes eligible for benefits.

[2] The formula to compute a family maximum is (1) 150% of PIA below the first bend point, plus (2) 272% of PIA in excess of the first bend point but not in excess of the second, plus (3) 134% of PIA in excess of the second bend point but not in excess of the third, plus (4) 175% of PIA in excess of the third bend point.

[3] Contribution and benefit base that would have been determined automatically under the law in effect prior to enactment of the Social Security Amendments of 1977. The bases for years after 1989 were increased slightly by changes to the indexing procedure to determine the base, as required by Public Law 101-239.

[4] No provision in law for this amount in this year.

[5] Amount specified for first year by Social Security Amendments of 1977; amounts for subsequent years subject to automatic-adjustment provisions.

In addition to the program amounts affecting the determination of OASDI benefits that reflect changes in the economy, there are certain legislated changes that have affected, and will affect, benefits. Two such changes are the scheduled increases in the normal retirement age and in the delayed retirement credits. Table V.C3 shows the scheduled changes in these two important items and their effect on benefits expressed as a percentage of PIA.

Table V.C3.—Legislated Changes in Normal Retirement Age and Delayed Retirement Credits, for Persons Reaching Age 62 in Each Year 1986 and Later

Year of birth	Year of attainment of age 62	Normal retirement age (NRA)	Credit for each year of delayed retirement after NRA (percent)	Benefit, as a percentage of PIA, beginning at age —				
				62	65	66	67	70
1924	1986	65	3	80	100	103	106	115
1925	1987	65	3 1/2	80	100	103 1/2	107	117 1/2
1926	1988	65	3 1/2	80	100	103 1/2	107	117 1/2
1927	1989	65	4	80	100	104	108	120
1928	1990	65	4	80	100	104	108	120
1929	1991	65	4 1/2	80	100	104 1/2	109	122 1/2
1930	1992	65	4 1/2	80	100	104 1/2	109	122 1/2
1931	1993	65	5	80	100	105	110	125
1932	1994	65	5	80	100	105	110	125
1933	1995	65	5 1/2	80	100	105 1/2	111	127 1/2
1934	1996	65	5 1/2	80	100	105 1/2	111	127 1/2
1935	1997	65	6	80	100	106	112	130
1936	1998	65	6	80	100	106	112	130
1937	1999	65	6 1/2	80	100	106 1/2	113	132 1/2
1938	2000	65, 2 mo	6 1/2	79 1/6	98 8/9	105 5/12	111 11/12	131 5/12
1939	2001	65, 4 mo	7	78 1/3	97 7/9	104 2/3	111 2/3	132 2/3
1940	2002	65, 6 mo	7	77 1/2	96 2/3	103 1/2	110 1/2	131 1/2
1941	2003	65, 8 mo	7 1/2	76 2/3	95 5/9	102 1/2	110	132 1/2
1942	2004	65, 10 mo	7 1/2	75 5/6	94 4/9	101 1/4	108 3/4	131 1/4
1943-54	2005-16	66	8	75	93 1/3	100	108	132
1955	2017	66, 2 mo	8	74 1/6	92 2/9	98 8/9	106 2/3	130 2/3
1956	2018	66, 4 mo	8	73 1/3	91 1/9	97 7/9	105 1/3	129 1/3
1957	2019	66, 6 mo	8	72 1/2	90	96 2/3	104	128
1958	2020	66, 8 mo	8	71 2/3	88 8/9	95 5/9	102 2/3	126 2/3
1959	2021	66, 10 mo	8	70 5/6	87 7/9	94 4/9	101 1/3	125 1/3
1960 & later	2022 & later	67	8	70	86 2/3	93 1/3	100	124

2. Covered Employment

Projections of the total labor force and unemployment rate are based on Bureau of Labor Statistics definitions from the Current Population Survey (CPS), and thus represent the average weekly number of employed and unemployed persons, aged 16 and over, in the U.S. in a calendar year. Total covered workers in a year are the number of persons who have any OASDI covered earnings at any time during the year. For those aged 16 and over, projected covered employment is the sum of age-sex components, each of

which is projected as a ratio to the CPS concept of employment. For those under age 16, projected covered employment is the sum of age-sex components, each of which is projected as a ratio to the Social Security area population. The projection methodology accounts for changes in the business cycle, the quarterly pattern of growth in employment within each year, changes in non-OASDI covered employment, the increase in coverage of Federal civilian employment as a result of the 1983 Social Security Amendments, and changes in the number of other-than-legal aliens estimated to be residing within the Social Security coverage area.

Covered worker rates are defined as the ratio of OASDI covered workers to the Social Security area population. The projected age-adjusted coverage rate for men, aged 16 and over, changes from its 2001 level of 73.0 percent to 73.2, 72.4, and 71.9 percent for 2080 for the low cost, intermediate, and high cost assumptions, respectively. (Age-adjusted covered worker rates are adjusted to the 2001 age distribution of the Social Security area population.) For women, it changes from its 2001 level of 61.7 percent to 62.9, 62.3, and 61.7 percent for 2080 for the low cost, intermediate, and high cost assumptions, respectively.

3. Taxable Payroll and Payroll Tax Revenue

The OASDI taxable payroll is the amount of earnings in a year which, when multiplied by the combined employee-employer tax rate, yields the total amount of taxes due from wages and self-employed income in the year. Taxable payroll is used in estimating OASDI income and in determining income and cost rates and actuarial balances. (See section IV.B.1, Annual Income Rates, Cost Rates, and Balances, for definitions of these terms.) Taxable payroll is computed from taxable earnings, defined as the sum of wages and self-employment earnings subject to the Social Security tax. Wages are adjusted to take into account the “excess wages” earned by workers with multiple jobs whose combined wages exceed the taxable earnings base. Also, from 1983 through 2001, taxable payroll includes deemed wage credits for military service. Prior to 1984, the self-employed tax rate was less than the combined employee-employer rate, thus taxable self-employed earnings were weighted to reflect this. Also, prior to 1988, employers were exempt from Social Security tax on part of their employees’ tips; taxable payroll was reduced by half of this exempt amount to take this into account.

Taxable earnings for employees, employers, and the self-employed are estimated from total earnings in covered employment. Covered earnings are summed from component sectors, each of which is based on the projected growth of U.S. earnings and a factor that reflects any projected change in

coverage (e.g., the increase in coverage in the Federal civilian sector due to mandatory coverage of newly hired employees). The level of taxable earnings, that is, covered earnings at or below the taxable earnings base, is then estimated based on adjustments to the latest available historical earnings distributions for wage and self-employed workers. The ratio of taxable to covered earnings decreased from about 90.2 percent in 1983 to 87.9 percent in 1994, or by an average annual rate of -0.2 percent. The ratio decreased further to 83.4 in 2000, then increased to 85.0 in 2001, and to 85.4 in 2002. The decline from 1994 through 2000 was mainly due to a relative increase in wages for high wage earners. At least some of this decline and subsequent increase is believed to be due to stock option activity surrounding the stock market bubble in 2000 and is not likely to recur.

However, some of the decline since 1983 is believed to be due to the change in the age-sex distribution of the workforce and other trend-like factors that are expected to continue through 2012 in all three alternatives. The projected taxable earnings ratios in 2012 are 84.5, 83.8, and 83.1 for the low cost, intermediate, and high cost assumptions, respectively. This represents average annual rates of change from 2002 of -0.1, -0.2, and -0.3 percent. After 2012, the taxable to covered ratio is held approximately constant.

Payroll tax revenue is computed by applying the appropriate tax rates to taxable wages and self-employment income, taking into account the lag between the time the tax liability is incurred and when the taxes are collected. In the case of wages, employers are required to deposit withholding taxes with the Treasury on a schedule determined by the amount of tax liability incurred. (Generally, the higher the amount of liability, the sooner the taxes must be paid—ranging from the middle of the following month to, for companies with very large payrolls, the next banking day after wages are paid.) Self-employed workers are required to make estimated tax payments on their earnings four times during the year, as well as making up any underestimate on their individual income tax return. The pattern of actual receipts by the Treasury is taken into account when estimating self-employed tax collections.

4. Insured Population

Eligibility for benefits under the OASDI program requires some minimal level of work in covered employment. This requirement is established by a worker's accumulation of quarters of coverage (QCs). Prior to 1978, one QC was credited for each calendar quarter in which at least $50 was earned. In 1978, when quarterly reporting of earnings was replaced by annual reporting, the amount required to earn a QC (up to a maximum of four per year) was set

at $250. Since then, this amount has been adjusted each year according to the Average Wage Index. Its value in 2003 is $890.

There are three types of insured status which can be acquired by a worker under the OASDI program. Each of these statuses is determined by the number and recency of QCs earned. Fully insured status is acquired by any worker whose total number of QCs is greater than or equal to the number of years elapsed after the year of attainment of age 21 (and at least 6). Once a worker has accumulated 40 QCs, he or she remains permanently fully insured. Disability-insured status is acquired by any fully insured worker over age 30 who has accumulated 20 QCs during the 40-quarter period ending with the current quarter; any fully insured worker aged 24-30 who has accumulated QCs during one-half of the quarters elapsed after the quarter of attainment of age 21 and up to and including the current quarter; and any fully insured worker under age 24 who has accumulated 6 QCs during the 12-quarter period ending with the current quarter. Currently insured status is acquired by any worker who has accumulated 6 QCs during the 13-quarter period ending with the current quarter. Periods of disability are excluded from the above described QC requirements for insured status (but do not reduce the minimum of 6 QCs).

There are many types of benefits payable to workers and their family members under the OASDI program. One of the requirements of eligibility for these benefits is the insured status of the worker. A worker must be fully insured to be eligible for a primary retirement benefit, and for his or her spouse or children to be eligible for auxiliary benefits. A deceased worker must have been either currently insured or fully insured at the time of death for his or her children (and their mother or father) to be eligible for benefits. If there are no eligible surviving children, the deceased worker must have been fully insured at the time of death for his or her surviving spouse to be eligible. A worker must be disability insured to be eligible for a primary disability benefit, and for his or her spouse or children to be eligible for auxiliary benefits.

Projections of the fully insured population, as a percentage of the Social Security area population, are made by age and sex for each birth cohort beginning with 1900. These percentages are based on 30,000 simulated work histories for each sex and birth cohort, which are constructed from past and projected coverage rates, median earnings, and amounts required for crediting QCs. These work histories are developed by a model which assumes that persons who have recently been out of covered employment are likely to remain out of covered employment. This model is driven by two sets of age-sex-specific parameters which are empirically set such that the simulated

fully insured percentages reproduce fairly closely the fully insured percentages estimated from the Continuous Work History Sample from 1970 to date.

Projections of the disability-insured population, as a percentage of the fully insured population, are made by age and sex for each birth cohort beginning with 1900. These percentages are based on the same simulated work histories used to project the fully insured percentages. Additional adjustments are made to bring the simulated disability-insured percentages into close agreement with those estimated from the Continuous Work History Sample. The principal adjustment is for periods of disability (which are not explicitly taken into account in the model). These periods (which reduce the normally applicable QC requirements) have a negligible effect on fully insured status at retirement age, but a substantial effect on disability-insured status.

Projections of the currently insured population are not made. This is because the number of beneficiaries who are entitled to benefits based solely on currently insured status has been very small, and is expected to remain small in the future.

Under this procedure, the percentage of the Social Security area population aged 62 and over that is fully insured is projected to increase from its estimated level of 78.2 for December 31, 1998, to 89.4, 90.3, and 91.1 for December 31, 2080, under alternatives I, II, and III, respectively. The percentage for females is projected to increase significantly, while that for males is projected to remain relatively unchanged. Under alternative II, for example, the percentage for males is projected to increase slightly during this period from 92.1 to 92.5, while that for females is projected to increase from 68.1 to 88.5.

5. Old-Age and Survivors Insurance Beneficiaries

The number of OASI beneficiaries is 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 number of beneficiaries is also projected by marital status.

For the short-range period, the number of retired-worker beneficiaries is developed by applying award rates to the aged fully insured population less those insured persons entitled to retired-worker, disabled-worker, aged widow(er)'s, or aged spouse's benefits, and by applying termination rates to the number of persons already receiving retired-worker benefits.

For the long-range period, the number of retired-worker beneficiaries not previously converted from disabled-worker beneficiary status is projected as

a percentage of the exposed population, i.e., the aged fully insured population less persons entitled to or converted from disability benefits and insured persons entitled to widow(er)'s benefits. For age 62, a linear regression is developed based on the relationship between the historical exposed percentage and the labor force participation rate. The regression coefficients are then used to project the percentage based on the projected labor force participation rate for age 62. The percentage for ages 70 and over is assumed to be nearly 100, because the retirement earnings test and delayed retirement credit do not apply after age 70, but is adjusted for the statistical difference between in-force data and in-current-payment data. The percentage for each age 63 through 69 is projected from the December 31, 2001 retired-worker beneficiaries data which reflects the elimination of the earnings test after normal retirement age, with an adjustment for changes in the portion of the primary insurance amount that is payable at each age of entitlement. As the normal retirement age increases, the number of retired-worker beneficiaries not automatically converted from disabled-worker beneficiary status as a percentage of the exposed population is gradually adjusted downward at each age 63 through 69.

For the long-range period also, the number of retired-worker beneficiaries previously converted from disabled-worker beneficiaries is calculated separately in a manner consistent with the calculation of disabled-worker beneficiaries.

The number of aged-spouse beneficiaries is 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, insured aged-spouse beneficiaries are projected concurrently with the retired-worker beneficiaries. Uninsured aged-spouse beneficiaries are projected, on the other hand, by applying award rates to the aged uninsured male or female population, and by applying termination rates to the population already receiving such benefits. In the long-range period, aged-spouse beneficiaries are estimated from the population projected by age, sex, and marital status. To the number of spouses aged 62 and over in the population, a series of factors are 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, and (6) the spouse is not eligible to receive a significant government pension based on earnings in noncovered employment. To

the resulting number of spouses a projected prevalence rate is applied to calculate the estimated number of aged-spouse beneficiaries.

In addition, the same factors are applied to the number 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 is at least 10 years in duration. Third, factor (3) above is 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, are based on the projected number of children in the population. In the short-range period, the number of entitled children is developed by applying award rates to the number of children in the population where both parents are alive, and by applying termination rates to the number of children already receiving benefits.

In the long-range period, the number of entitled children is projected separately by sex of the wage-earner parent. To the number of children in the population, factors are applied representing the probabilities that the parent is alive, aged 62 or over, insured, and receiving a retired-worker benefit. Another factor is applied representing the probability that the child is not entitled to a benefit based on the other parent's earnings. In addition, a factor is applied to reduce the number of beneficiaries to reflect the more restrictive requirements for entitlement of stepchildren that were enacted in Public Law 104-121. For children aged 18, a factor representing the probability that the child is attending a secondary school is also applied.

The number of disabled children aged 18 and over of retired-worker beneficiaries is projected from the adult population. In the short-range period, award rates are applied to the population, and termination rates are applied to the number of disabled children already receiving benefits. In the long-range period, disabled children are projected in a manner similar to that for children under 18, with the inclusion of a factor representing the probability of being disabled since childhood.

In the short-range period, the number of entitled young-spouse beneficiaries is developed by applying award rates to the number of awards to children of retired workers, where the children are either under age 16 or disabled, and by applying termination rates to the number of young-spouses already

receiving benefits. In the long-range period, young-spouse beneficiaries are projected as a proportion of the projected number of child beneficiaries of retired workers, taking into account projected changes in average family size.

The number of aged-widow(er) beneficiaries is projected from the population by age and sex. In the short-range period, insured aged-widow(er) beneficiaries are projected concurrently with the retired-worker beneficiaries. Uninsured aged-widow(er) beneficiaries are projected, on the other hand, by applying award rates to the aged uninsured male or female population, and by applying termination rates to the population already receiving such benefits. In the long-range period, aged-widow(er) beneficiaries are projected from the population by age, sex, and marital status. Four factors are applied to the number of widow(er)s in the population aged 60 and over. These factors represent the probabilities that (1) the deceased wage earner is 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)'s benefits. Also, the same factors are applied to the number 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 is at least 10 years in duration.

In the short-range period, the number of disabled-widow(er) beneficiaries is developed by applying award rates to the uninsured male or female population, and by applying termination rates to the population already receiving a disabled widow(er) benefit. In the long-range period, the number is 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, are based on the projected number of children in the population whose mothers or fathers are deceased. In the short-range period, the number of entitled children is developed by applying award rates to the number of orphaned children, and by applying termination rates to the number of children already receiving benefits.

In the long-range period, the number of child-survivor beneficiaries is 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 replaced by a factor that represents the probability that the parent is deceased.

In the short-range period, the numbers of entitled mother-survivor and father-survivor beneficiaries are developed by applying award rates to the number of awards to child-survivor beneficiaries, where the children are either under age 16 or disabled, and by applying termination rates to the number of mother-survivors and father-survivors already receiving benefits. In the long-range period, mother-survivor and father-survivor beneficiaries are estimated from the number of child-survivor beneficiaries, taking into account projected changes in average family size.

The number of parent-survivor beneficiaries is projected based on the historical pattern of the number of such beneficiaries.

Table V.C4 shows the projected number of beneficiaries under the OASI program by type of benefit. 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 number of such residual payments are made separately for spouses and widow(er)s.

Table V.C4.—OASI Beneficiaries With Benefits in Current-Payment Status at the End of Calendar Years 1945-2080

[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	16,589	2,867	643	3,888	582	2,919	21	27,509
1980	19,564	3,018	639	4,415	563	2,610	15	30,823
1985	22,435	3,069	456	4,863	372	1,918	10	33,123
1986	22,985	3,088	450	4,931	350	1,878	9	33,691
1987	23,444	3,090	439	4,984	329	1,837	8	34,130
1988	23,862	3,086	432	5,029	318	1,809	7	34,543
1989	24,331	3,093	422	5,071	312	1,782	6	35,017
1990	24,841	3,101	421	5,111	304	1,777	6	35,562
1991	25,293	3,104	425	5,158	301	1,792	5	36,078
1992	25,762	3,112	431	5,205	294	1,808	5	36,618
1993	26,109	3,094	436	5,224	289	1,837	5	36,994
1994	26,412	3,066	440	5,232	283	1,865	4	37,303
1995	26,679	3,026	441	5,226	275	1,884	4	37,534
1996	26,905	2,970	442	5,210	242	1,898	4	37,671
1997	27,282	2,922	441	5,053	230	1,893	3	37,825
1998	27,518	2,864	439	4,990	221	1,884	3	37,918
1999	27,784	2,811	442	4,944	212	1,885	3	38,081
2000	28,505	2,798	459	4,901	203	1,878	3	38,748
2001	28,843	2,742	467	4,828	197	1,890	3	38,969
2002	29,195	2,681	477	4,770	194	1,908	2	39,226
Intermediate:								
2005	30,353	2,616	496	4,739	182	1,911	2	40,299
2010	33,975	2,617	500	4,812	168	1,860	2	43,934
2015	40,250	2,616	679	4,904	160	1,903	2	50,514
2020	47,858	2,635	762	4,922	158	1,901	2	58,237
2025	54,868	2,677	851	5,009	160	1,903	2	65,470
2030	61,130	2,664	917	5,081	159	1,902	2	71,854
2035	65,078	2,625	946	5,146	155	1,885	2	75,836
2040	67,115	2,627	952	5,196	150	1,850	2	77,891
2045	68,837	2,639	958	5,245	145	1,821	2	79,646
2050	71,119	2,701	977	5,265	141	1,799	2	82,003
2055	73,937	2,788	1,009	5,271	137	1,771	2	84,914
2060	76,595	2,833	1,026	5,266	133	1,740	2	87,596
2065	78,888	2,878	1,042	5,317	129	1,712	2	89,967
2070	81,341	2,915	1,057	5,397	125	1,687	2	92,523
2075	83,796	2,962	1,074	5,470	121	1,664	2	95,088
2080	86,214	3,016	1,091	5,504	117	1,643	2	97,587

Table V.C4.—OASI Beneficiaries With Benefits in Current-Payment Status at the End of Calendar Years 1945-2080 (Cont.)
[In thousands]

	Retired workers and auxiliaries			Survivors				
Calendar year	Worker	Wife-husband	Child	Widow-widower	Mother-father	Child	Parent	Total
Low Cost:								
2005	30,356	2,617	496	4,738	182	1,917	2	40,308
2010	33,923	2,624	503	4,799	172	1,895	2	43,918
2015	39,644	2,582	682	4,937	160	2,005	2	50,011
2020	46,730	2,588	771	4,982	158	2,069	2	57,299
2025	53,145	2,603	871	5,101	159	2,149	2	64,030
2030	58,688	2,548	954	5,195	159	2,226	2	69,772
2035	61,858	2,474	1,002	5,255	159	2,280	2	73,029
2040	63,240	2,434	1,030	5,276	157	2,308	2	74,447
2045	64,501	2,421	1,058	5,286	156	2,330	2	75,755
2050	66,487	2,474	1,100	5,272	157	2,362	2	77,853
2055	69,111	2,537	1,160	5,256	159	2,395	2	80,620
2060	71,527	2,570	1,206	5,250	161	2,429	2	83,144
2065	73,472	2,606	1,245	5,308	163	2,464	2	85,260
2070	75,595	2,652	1,285	5,407	164	2,498	2	87,603
2075	78,117	2,699	1,330	5,519	165	2,533	2	90,365
2080	81,112	2,761	1,380	5,620	166	2,572	2	93,612
High Cost:								
2005	30,323	2,615	495	4,740	181	1,905	2	40,261
2010	34,005	2,613	496	4,827	164	1,825	2	43,933
2015	40,926	2,682	679	4,862	158	1,794	2	51,102
2020	49,140	2,735	759	4,837	153	1,722	2	59,348
2025	56,888	2,842	839	4,877	150	1,649	2	67,246
2030	64,091	2,906	893	4,917	145	1,581	2	74,535
2035	69,107	2,943	904	4,990	135	1,508	2	79,589
2040	72,178	3,008	889	5,080	124	1,430	2	82,710
2045	74,780	3,072	873	5,180	115	1,368	2	85,388
2050	77,792	3,166	867	5,244	106	1,317	2	88,493
2055	81,246	3,280	870	5,273	97	1,259	2	92,028
2060	84,593	3,334	860	5,257	89	1,201	2	95,336
2065	87,640	3,387	856	5,273	81	1,148	2	98,387
2070	90,779	3,439	852	5,311	74	1,101	2	101,558
2075	93,572	3,477	848	5,331	68	1,058	2	104,355
2080	95,837	3,502	843	5,292	62	1,020	2	106,558

Note: The number of beneficiaries does not include certain uninsured persons, most of whom both attained age 72 before 1968 and have fewer than 3 quarters of coverage, in which case the costs are reimbursed by the General Fund of the Treasury. Totals do not necessarily equal the sums of rounded components.

6. Disability Insurance Beneficiaries

Benefits are paid from the DI Trust Fund to individuals who satisfy the disability-insured requirements, who are unable to engage in substantial gainful activity due to medically determinable physical or mental impairment severe enough to satisfy the requirements of the program, and have not yet attained normal retirement age. Spouses and children of such disabled workers may also receive DI benefits provided they satisfy certain criteria, mostly depending upon age or the age of a child in the care of the non-disabled spouse. In projecting future benefit outlays from the DI Trust Fund, the number of DI

beneficiaries is projected for each type of beneficiary separately, by the sex of the disabled worker on whose earnings the benefits are based, and the age of the beneficiary. Such projections are accomplished using standard actuarial methods reflecting future additions to the DI rolls through awards of new benefits, and subtractions from the rolls due to death, recovery, or administrative conversion upon attainment of normal retirement age from status as a disabled-worker beneficiary to status as a retired-worker beneficiary. The long-range and short-range models used to make these projections are both constructed from this basic outline, but differ in some details reflecting their respective uses.

The number of new entitlements to disabled-worker benefits during each year is projected by applying assumed age-sex specific disability incidence rates to the projected disability-exposed population.[1] Long-range ultimate disability incidence rates are selected based on careful analysis of historical patterns and expected future conditions, including the impact of scheduled increases in the normal retirement age.[2] Incidence rates for the first half of the short-range period reflect the most recent actual experience along with consideration of other factors expected to affect the processing of disability claims in the near term. Over the latter half of the short-range period, incidence rates are assumed to trend into levels consistent with the long-range ultimate incidence rate assumptions.

These assumed incidence rates are summarized in figure V.C3 and table V.C5. As illustrated in figure V.C3, incidence rates have varied within a wide range over the past 30 years. Although not completely understood, this variation is attributed in large part to a variety of demographic and economic factors, along with the effects of changes due to legislation and program administration.[3] The solid lines in figure V.C3 illustrate values of the summarized incidence rate, age-sex adjusted to the distribution of the disability-exposed population for 1998. Such adjustment facilitates meaningful comparisons over long periods of time. From a historically high level of about 7 awards per thousand insured in 1975, age-sex-adjusted rates declined to about 3.6 per thousand by 1982. Following a gradual trend upward, rates

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[1] The disability-exposed population is the disability-insured population that is not currently entitled for disabled-worker benefits.

[2] Incidence rates are adjusted upward to account for the additional workers who are expected to file for disability benefits rather than for reduced retirement benefits that are even more reduced when the NRA is greater than age 65.

[3] A more detailed discussion of the recent history of the DI program is presented in Actuarial Study 114, "Social Security Disability Insurance Program Worker Experience", June 1999. This study can be found on the Internet at http://www.ssa.gov/OACT/NOTES/AS114/as114Foreword.html.

increased to about 5.7 per thousand by 1992, but declined from that point to about 4.6 per thousand in 2000. As described in chapter IV, in the discussion of the short-range DI estimates, the incidence rate experience for 2001-02, and the projections for 2003-07, are affected by a one-time special workload. In addition to historical values, figure V.C3 displays the age-sex-adjusted short-range incidence rates under the three alternative sets of assumptions. Gross (unadjusted) incidence rates are also shown in figure V.C3 in dashed lines. These unadjusted rates are heavily influenced by the changing age-sex distribution of the exposed population over time. This is especially noticeable in the period 2003 to 2012 when the aging baby-boom generation will be concentrated in the ages of highest disability incidence.

Figure V.C3.—DI Disabled Worker Incidence Rates, 1970-2012
[Awards per thousand disability exposed]

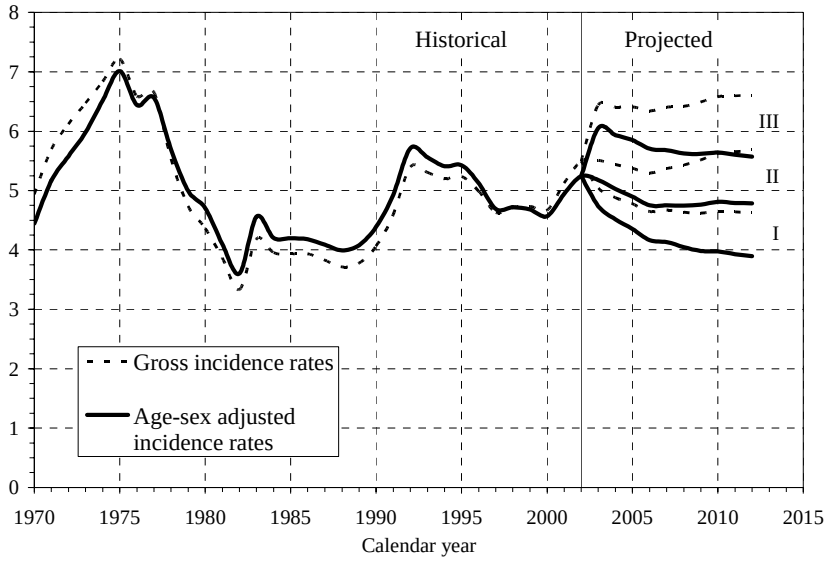

Table V.C5 presents the long-range ultimate incidence rate assumptions age-sex adjusted to the disability-exposed population as of January 1, 1996. The table also indicates the year in which the ultimate values are attained, along with an indication of the relationship between those ultimate rates and the rates for the base period (1994-96) that was used to develop relative levels of disability incidence by age and sex for long-range assumptions.

For the 2003 report, two modifications were made in the way the base disabled-worker incidence rates are calculated. Incidence rates for the base

period (1994-96) reflect individuals who become newly entitled to benefits within the base period. Last year, these entitlements included persons awarded benefits during the period 1994-99. This year, the entitlements were updated to include individuals awarded benefits during the period 2000-02. The base incidence rates were also changed due to modifications in the calculation of the exposed population. The ultimate age-sex adjusted incidence rate under the intermediate assumptions in last year's report was 5.5 per thousand. However, the rate for last year's report would have been shown as 5.7 per thousand if calculated on the same basis as used for this year's report. Under the intermediate assumptions in this year's report, the ultimate age-sex adjusted incidence rate is 5.6 per thousand, slightly lower than the ultimate revised level of last year's report.

Table V.C5.—Long-Range Ultimate Disabled Worker Age-Sex Adjusted Incidence Rates[1]

	Ultimate incidence rate	Year ultimate rate is attained[2]	Percent change from base period[3] to ultimate rate
Intermediate assumption	5.6	2027	+8
Low cost assumption	4.5	2027	-13
High cost assumption	6.7	2027	+30

[1] Number of annual new disabled-worker entitlements per thousand disability-exposed, age-sex adjusted to the disability-exposed population as of January 1, 1996.
[2] The transition to ultimate incidence rates is generally completed in 2022. However, for ages 61 through 66 incidence rates are adjusted through 2027 in order to reflect increases in the normal retirement age (NRA) that are scheduled in the law.
[3] Base period rate for long-range incidence rate assumptions is 5.2 per thousand representing the average age-sex adjusted incidence rate for 1994-96.

The number of disabled-worker beneficiaries having their benefits terminated during each year is projected by applying assumed termination rates to the disabled-worker population. The termination rates are developed by age, sex, and reason for termination.[1] In addition, in the long-range period, termination rates are also assumed to vary by duration of entitlement to disabled-worker benefits. To this number of terminations is added the number of disabled-worker beneficiaries who would be automatically converted to retired-worker beneficiaries upon attainment of the normal retirement age.

In the short-range period, gross death rates under the intermediate assumptions are projected to remain between 31 and 33 deaths per thousand disabled workers. The pattern of projected recovery rates under the intermediate

[1] Reasons for termination include death, recovery and (in the short range only) a small residual category of terminations for special administrative reasons.

assumptions is consistent with assumed levels of continuing disability reviews required to fulfill the legislative mandate for regular reviews of all disabled beneficiaries. Under low cost (high cost) assumptions, terminations due to death, recovery, and other reasons increase (decrease) to levels roughly 8 percent higher (lower) than those under the intermediate assumptions.

For the long-range period, projection of death rates and recovery rates begins with an analysis of such rates split by age, sex, and duration of entitlement over the base period 1991-95.[1] Under the intermediate assumptions, recovery rates for both males and females, are assumed to remain approximately constant after 2022. Death rates over the long-range period are assumed to change gradually, at about the same trend as for death rates in the general population, reaching levels in 2080 which are lower than the base period level by 58 percent for males and 49 percent for females.

Under the low cost assumptions, recovery rates and death rates are assumed to be higher than the corresponding levels assumed for the intermediate assumptions. Ultimate recovery rates are assumed to be higher than the base period rate by 125 percent for males and by 89 percent for females, while death rates are assumed to change gradually reaching levels for 2080 which are lower than the base period level by 42 percent for males and 31 percent for females.

Under the high cost assumptions, recovery rates and death rates are assumed to be lower than the corresponding levels assumed for the intermediate assumptions. Ultimate recovery rates are assumed to be higher than the base period rate by 50 percent for males and by 26 percent for females, while death rates are assumed to change gradually reaching levels for 2080 which are lower than the base period level by 75 percent for males and 71 percent for females.

These detailed projections of disabled-worker entitlements and terminations are combined using standard multiple decrement techniques to produce projections of numbers of disabled workers in current-payment status over the 75-year projection period. These projections are presented in table V.C6. As indicated in that table, the number of disabled workers in current-payment status is projected to grow from 5.5 million at the end of 2002, to 11.6 million, 12.9 million, or 14.1 million at the end of 2080, under the low cost, intermediate, or high cost assumptions, respectively. Of course, much

[1] The termination rate analysis was based on work presented in Actuarial Study 114 referenced previously.

of this growth is a direct result of the growth and aging of the population described earlier in this chapter.

Another way to view this projected growth in disabled workers is to compare the size of the projected disabled-worker population to the size of the underlying disability-insured population reflecting the age-sex distribution of the insured population as of January 1, 1996. Such a ratio eliminates the effects of the aging population and is referred to as the disabled worker age-sex adjusted prevalence rate. Expressed in these terms, the prevalence of disability is projected to grow from 34.5 per thousand disability insured at the beginning of 2002, to 45.9 per thousand, and 59.0 per thousand at the beginning of 2080, under the intermediate, and high cost assumptions, respectively. Under the low cost assumptions, the disability prevalence rate is projected to remain fairly constant, at 34.5 per thousand.

Table V.C6 also presents projections of the numbers of auxiliary beneficiaries paid from the DI Trust Fund. As indicated at the beginning of this subsection, such auxiliary beneficiaries consist of qualifying spouses and children of disabled workers. In the case of children, the child must be either (1) under age 18, (2) age 18 and still a student in high school, or (3) over age 18 and disabled prior to age 22. In the case of spouses, the spouse must either be at least age 62, or have an eligible child beneficiary who is either under age 16 or disabled in his or her care.

In general, such auxiliary beneficiaries are projected in a manner that is related to the projected number of disabled-worker beneficiaries. In the short-range period, this is accomplished for family members of disabled-worker beneficiaries by projecting incidence and termination rates for each category of auxiliary beneficiary. In the long-range period, the child beneficiaries at ages 18 and under are projected in relation to the projected number of children in the population, by applying factors representing the probability that either of their parents is insured and disabled. Spouses eligible because they have an eligible child in care are projected relative to the projected number of such children. The remaining categories of children and spouses are projected in relation to the projected number of disabled-worker beneficiaries.

Table V.C6.—DI Beneficiaries With Benefits in Current-Payment Status at the End of Calendar Years 1960-2080
[In thousands]

Calendar year	Disabled worker	Auxiliaries: Wife-husband	Auxiliaries: Child	Total
Historical data:				
1960	455	77	155	687
1965	988	193	558	1,739
1970	1,493	283	889	2,665
1975	2,488	453	1,411	4,351
1980	2,856	462	1,359	4,677
1985	2,653	306	945	3,904
1986	2,725	301	965	3,991
1987	2,782	291	968	4,041
1988	2,826	281	963	4,070
1989	2,891	271	962	4,124
1990	3,007	266	989	4,261
1991	3,191	266	1,052	4,509
1992	3,464	271	1,151	4,886
1993	3,721	273	1,255	5,249
1994	3,958	271	1,350	5,579
1995	4,179	264	1,409	5,852
1996	4,378	224	1,463	6,065
1997	4,501	207	1,438	6,146
1998	4,691	190	1,446	6,327
1999	4,870	176	1,468	6,514
2000	5,036	165	1,466	6,667
2001	5,268	157	1,482	6,907
2002	5,539	152	1,526	7,217
Intermediate:				
2005	6,369	156	1,659	8,184
2010	7,400	165	1,863	9,428
2015	8,101	174	2,004	10,279
2020	8,721	192	2,171	11,084
2025	9,651	225	2,401	12,278
2030	9,931	233	2,579	12,743
2035	10,202	239	2,699	13,140
2040	10,689	250	2,774	13,713
2045	11,283	260	2,832	14,374
2050	11,635	268	2,891	14,794
2055	11,856	272	2,950	15,078
2060	11,914	272	2,997	15,183
2065	12,206	277	3,038	15,520
2070	12,477	281	3,073	15,831
2075	12,705	286	3,110	16,100
2080	12,871	289	3,151	16,311

Table V.C6.—DI Beneficiaries With Benefits in Current-Payment Status at the End of Calendar Years 1960-2080 (Cont.)
[In thousands]

Calendar year	Disabled worker	Auxiliaries: Wife-husband	Auxiliaries: Child	Total
Low Cost:				
2005	6,108	148	1,584	7,840
2010	6,648	146	1,663	8,458
2015	7,776	154	1,923	9,853
2020	7,983	157	2,006	10,146
2025	8,339	170	2,137	10,645
2030	8,271	164	2,268	10,703
2035	8,343	162	2,382	10,887
2040	8,674	166	2,476	11,316
2045	9,136	173	2,560	11,868
2050	9,439	179	2,655	12,274
2055	9,677	184	2,768	12,628
2060	9,839	187	2,883	12,908
2065	10,244	193	2,997	13,434
2070	10,709	201	3,106	14,016
2075	11,176	207	3,217	14,601
2080	11,600	214	3,332	15,147
High Cost:				
2005	6,793	172	1,793	8,759
2010	8,364	190	2,112	10,666
2015	8,536	204	2,117	10,857
2020	9,573	242	2,353	12,167
2025	11,084	303	2,659	14,045
2030	11,733	330	2,857	14,920
2035	12,240	346	2,956	15,542
2040	12,926	362	2,991	16,279
2045	13,689	375	3,012	17,076
2050	14,116	381	3,030	17,527
2055	14,326	382	3,025	17,733
2060	14,261	373	2,996	17,630
2065	14,392	373	2,957	17,722
2070	14,372	371	2,915	17,658
2075	14,253	367	2,878	17,498
2080	14,071	363	2,849	17,284

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

7. Average Benefits

Average benefits are 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 are calculated from projected distributions of beneficiaries by duration from year of award, average awarded PIAs, and increases thereto since the year of award, reflecting automatic benefit increases, recomputations to reflect additional covered earnings, and other factors. Average awarded PIAs are calculated from projected earnings histories, which are developed from the actual earnings histories associated with a sample of awards made in 2002. A sample of 2001 awards was used for the 2002 report.

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 are based on projections of age distributions at initial entitlement.

8. Benefit Payments

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

Lump-sum death payments are calculated as the product of (1) the number of such payments, which is 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 (not indexed in future years).

9. Administrative Expenses

The projection of administrative expenses through 2012 is based on historical experience and the expected growth in average wages. Additionally, estimates for the first several years of the projection are provided by the Office of Budget. For years after 2012, administrative expenses are assumed to increase because of increases in the number of beneficiaries and increases in the average wage which will more than offset assumed improvements in administrative productivity.

10. 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 (1) 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 administrative expenses associated with these benefits, and (2) the amount of OASDI payroll tax and income tax that would be received with allowances for interest from railroad workers.

The effect of the financial interchange with the Railroad Retirement program is evaluated on the basis of trends similar to those used in estimating the cost of OASDI benefits. The resulting effect is annual short-range costs of about $3-5 billion and a long-range summarized cost of 0.04 percent of taxable payroll to the OASDI program.

11. Benefits to Uninsured Persons

Some older persons had little or no chance to become fully insured for Social Security benefits during their working lifetimes. Special payments from the OASI Trust Fund may be granted to uninsured persons who either: (1) attained age 72 before 1968, or (2) attained age 72 in 1968 or later and had 3 quarters of coverage for each year after 1966 and before the year of attainment of age 72. Benefits and costs associated with uninsured persons of the first type above are reimbursable from the General Fund of the Treasury. All projected costs associated with reimbursable and non-reimbursable payments to uninsured persons are insignificant.

12. Military-Service Transfers

Beginning in 1966, the OASI and DI Trust Funds were reimbursed annually for the cost (including administrative expenses) of providing additional benefit payments resulting from noncontributory wage credits for military service performed prior to 1957. The 1983 amendments modified the reimbursement mechanism and the timing of the reimbursements, and required a transfer in 1983 to include all future costs attributable to the wage credits. The amendments also require adjustments to that 1983 transfer every fifth year, beginning with 1985, to account for actual data.

The adjustments for 2000 included a transfer of $836 million from the DI Trust Fund to the General Fund of the Treasury. The $393 million that was scheduled to be transferred from the general fund to the OASI Trust Fund did not occur in 2000, but was transferred with an allowance for interest in February 2002.

13. Income From Taxation of Benefits

Under present law, the OASI and DI Trust Funds are credited with the additional income taxes attributable to the taxation of up to the first 50 percent of OASI and DI benefit payments. (The remainder of the income taxes attributable to the taxation of up to 85 percent of OASI and DI benefit payments is credited to the HI Trust Fund.)

For the short-range period, income to the trust funds from such taxation is estimated by applying the following two factors to total OASI and DI benefit payments: (1) the percentage of benefit payments (limited to 50 percent) that is taxable, and (2) the average marginal tax rate applicable to those benefits.

For the long-range period, income to the trust funds from such taxation is estimated by applying projected ratios of taxation of OASI and DI benefits to total OASI and DI benefit payments. Because the income thresholds used for benefit taxation are, by law, constant in the future, their values in relation to future income and benefit levels will decline. Thus, ratios of income from taxation of benefits to the amount of benefits are projected to increase gradually. The ultimate ratios of taxation of OASI and DI benefits are estimated by the Office of Tax Analysis, Department of the Treasury, relating the Current Population Survey income distribution of OASDI beneficiaries to tax rates in a sample of recent tax returns.

VI. APPENDICES

A. HISTORY OF OASI AND DI TRUST FUND OPERATIONS

The Federal Old-Age and Survivors Insurance (OASI) Trust Fund was established on January 1, 1940, as a separate account in the United States Treasury. The Federal Disability Insurance (DI) Trust Fund, another separate account in the United States Treasury was established on August 1, 1956. All the financial operations of the OASI and DI programs are handled through these respective funds. The Board of Trustees[1] is responsible for overseeing the financial operations of these funds. The following paragraphs describe the various components of trust fund income and outgo. The tables at the end of this section present the historical operations of the separate trust funds since their inception, as well as the operations of the combined trust funds during the period when they have co-existed.

The primary receipts of these two funds are amounts appropriated to each of them under permanent authority on the basis of contributions payable by workers, their employers, and individuals with self-employment income, in work covered by the OASDI program. All employees, and their employers, in covered employment are required to pay contributions with respect to their wages. Employees, and their employers, are also required to pay contributions with respect to cash tips, if the individual's monthly cash tips amount to at least $20. All self-employed persons are required to pay contributions with respect to their covered net earnings from self-employment. In addition to paying the required employer contributions on the wages of covered Federal employees, the Federal Government also pays amounts equivalent to the combined employer and employee contributions that would be paid on deemed wage credits attributable to military service performed between 1957 and 2001 if such wage credits were covered wages.

In general, an individual's contributions, or taxes, are computed on wages or net earnings from self-employment, or both wages and net self-employment earnings combined, up to a specified maximum annual amount. The contributions are determined first on the wages and then on any net self-employment earnings, such that the total does not exceed the annual maximum amount. An employee who pays contributions on wages in excess of the

[1] The Board is composed of six members, four of whom serve automatically by virtue of their positions in the Federal Government: the Secretary of the Treasury, who is the Managing Trustee, the Secretary of Labor, the Secretary of Health and Human Services, and the Commissioner of Social Security. The other two members are appointed by the President and confirmed by the Senate to serve as public representatives: John L. Palmer and Thomas R. Saving are currently serving 4-year terms that began on October 28, 2000.

annual maximum amount (because of employment with two or more employers) is eligible for a refund of the excess employee contributions.

The monthly benefit amount to which an individual (or his or her spouse and children) may become entitled under the OASDI program is based on the individual's taxable earnings during his or her lifetime. For almost all persons who first become eligible to receive benefits in 1979 or later, the earnings used in the computation of benefits are indexed to reflect increases in average wage levels.

The contribution, or tax, rates applicable under current law in each calendar year and the allocation of these rates between the OASI and DI Trust Funds are shown in table VI.A1.[1] The maximum amount of earnings on which OASDI contributions are payable in a year, which is also the maximum amount of earnings creditable in that year for benefit-computation purposes, is called the contribution and benefit base. The contribution and benefit base for each year through 2003 is also shown in table VI.A1.

Table VI.A1.—Contribution and Benefit Base and Contribution Rates

Calendar years	Contribution and benefit base	Contribution rates (percent)					
		Employees and employers, each			Self-employed		
		OASDI	OASI	DI	OASDI	OASI	DI
1937-49	$3,000	1.000	1.000	—	—	—	—
1950	3,000	1.500	1.500	—	—	—	—
1951-53	3,600	1.500	1.500	—	2.2500	2.2500	—
1954	3,600	2.000	2.000	—	3.0000	3.0000	—
1955-56	4,200	2.000	2.000	—	3.0000	3.0000	—
1957-58	4,200	2.250	2.000	0.250	3.3750	3.0000	0.3750
1959	4,800	2.500	2.250	.250	3.7500	3.3750	.3750
1960-61	4,800	3.000	2.750	.250	4.5000	4.1250	.3750
1962	4,800	3.125	2.875	.250	4.7000	4.3250	.3750
1963-65	4,800	3.625	3.375	.250	5.4000	5.0250	.3750
1966	6,600	3.850	3.500	.350	5.8000	5.2750	.5250
1967	6,600	3.900	3.550	.350	5.9000	5.3750	.5250
1968	7,800	3.800	3.325	.475	5.8000	5.0875	.7125
1969	7,800	4.200	3.725	.475	6.3000	5.5875	.7125
1970	7,800	4.200	3.650	.550	6.3000	5.4750	.8250
1971	7,800	4.600	4.050	.550	6.9000	6.0750	.8250
1972	9,000	4.600	4.050	.550	6.9000	6.0750	.8250
1973	10,800	4.850	4.300	.550	7.0000	6.2050	.7950
1974	13,200	4.950	4.375	.575	7.0000	6.1850	.8150
1975	14,100	4.950	4.375	.575	7.0000	6.1850	.8150
1976	15,300	4.950	4.375	.575	7.0000	6.1850	.8150
1977	16,500	4.950	4.375	.575	7.0000	6.1850	.8150
1978	17,700	5.050	4.275	.775	7.1000	6.0100	1.0900
1979	22,900	5.080	4.330	.750	7.0500	6.0100	1.0400
1980	25,900	5.080	4.520	.560	7.0500	6.2725	.7775

[1] The contribution rates for the Hospital Insurance (HI) program, and for the OASDI and HI programs combined, are shown in table VI.F1.

Table VI.A1.—Contribution and Benefit Base and Contribution Rates (Cont.)

Calendar years	Contribution and benefit base	Contribution rates (percent)					
		Employees and employers, each			Self-employed		
		OASDI	OASI	DI	OASDI	OASI	DI
1981	$29,700	5.350	4.700	0.650	8.0000	7.0250	0.9750
1982	32,400	5.400	4.575	.825	8.0500	6.8125	1.2375
1983	35,700	5.400	4.775	.625	8.0500	7.1125	.9375
1984[1]	37,800	5.700	5.200	.500	11.4000	10.4000	1.0000
1985[1]	39,600	5.700	5.200	.500	11.4000	10.4000	1.0000
1986[1]	42,000	5.700	5.200	.500	11.4000	10.4000	1.0000
1987[1]	43,800	5.700	5.200	.500	11.4000	10.4000	1.0000
1988[1]	45,000	6.060	5.530	.530	12.1200	11.0600	1.0600
1989[1]	48,000	6.060	5.530	.530	12.1200	11.0600	1.0600
1990	51,300	6.200	5.600	.600	12.4000	11.2000	1.2000
1991	53,400	6.200	5.600	.600	12.4000	11.2000	1.2000
1992	55,500	6.200	5.600	.600	12.4000	11.2000	1.2000
1993	57,600	6.200	5.600	.600	12.4000	11.2000	1.2000
1994	60,600	6.200	5.260	.940	12.4000	10.5200	1.8800
1995	61,200	6.200	5.260	.940	12.4000	10.5200	1.8800
1996	62,700	6.200	5.260	.940	12.4000	10.5200	1.8800
1997	65,400	6.200	5.350	.850	12.4000	10.7000	1.7000
1998	68,400	6.200	5.350	.850	12.4000	10.7000	1.7000
1999	72,600	6.200	5.350	.850	12.4000	10.7000	1.7000
2000	76,200	6.200	5.300	.900	12.4000	10.6000	1.8000
2001	80,400	6.200	5.300	.900	12.4000	10.6000	1.8000
2002	84,900	6.200	5.300	.900	12.4000	10.6000	1.8000
2003	87,000	6.200	5.300	.900	12.4000	10.6000	1.8000
2004 and later	[2]	6.200	5.300	.900	12.4000	10.6000	1.8000

[1] In 1984 only, an immediate credit of 0.3 percent of taxable wages was allowed against the OASDI contributions paid by employees, which resulted in an effective contribution rate of 5.4 percent. The appropriations of contributions to the trust funds, however, were based on the combined employee-employer rate of 11.4 percent, as if the credit for employees did not apply. Similar credits of 2.7 percent, 2.3 percent, and 2.0 percent were allowed against the combined OASDI and Hospital Insurance (HI) contributions on net earnings from self-employment in 1984, 1985, and 1986-89, respectively. Beginning in 1990, self-employed persons are allowed a deduction, for purposes of computing their net earnings, equal to half of the combined OASDI and HI contributions that would be payable without regard to the contribution and benefit base. The OASDI contribution rate is then applied to net earnings after this deduction, but subject to the OASDI base.
[2] Subject to automatic adjustment based on increases in average wages.

All contributions are collected by the Internal Revenue Service and deposited in the General Fund of the Treasury. The contributions are immediately and automatically appropriated to the trust funds on an estimated basis. The exact amount of contributions received is not known initially because the OASDI and HI contributions and individual income taxes are not separately identified in collection reports received by the Internal Revenue Service. Periodic adjustments are subsequently made to the extent that the estimates are found to differ from the amounts of contributions actually payable as determined from reported earnings. Adjustments are also made to account for any refunds to employees (with more than one employer) who paid contributions on wages in excess of the contribution and benefit base.

Beginning in 1984, up to one-half of an individual's or couple's OASDI benefits was subject to Federal income taxation under certain circumstances. Effective for taxable years beginning after 1993, the maximum percentage of benefits subject to taxation was increased from 50 percent to 85 percent. The proceeds from taxation of up to 50 percent of benefits are credited to the OASI and DI Trust Funds in advance, on an estimated basis, at the beginning of each calendar quarter, with no reimbursement to the general fund for interest costs attributable to the advance transfers.[1] Subsequent adjustments are made based on the actual amounts as shown on annual income tax records. The amounts appropriated from the General Fund of the Treasury are allocated to the OASI and DI Trust Funds on the basis of the income taxes paid on the benefits from each fund.[2]

Another source of income to the trust funds is interest received on investments held by the trust funds. That portion of each trust fund which is not required to meet current cost of benefits and administration is invested, on a daily basis, primarily in interest-bearing obligations of the U.S. Government (including special public-debt obligations described below). Investments may also be made in obligations guaranteed as to both principal and interest by the United States, including certain Federally sponsored agency obligations that are designated in the laws authorizing their issuance as lawful investments for fiduciary and trust funds under the control and authority of the United States or any officer of the United States. These obligations may be acquired on original issue at the issue price or by purchase of outstanding obligations at their market price.

The Social Security Act authorizes the issuance of special public-debt obligations for purchase exclusively by the trust funds. The Act provides that the interest rate on new special obligations will be the average market yield, as of the last business day of a month, on all of the outstanding marketable U.S. obligations that are due or callable more than 4 years in the future. The rate so calculated is rounded to the nearest one-eighth of one percent and applies to new issues in the following month. Beginning January 1999, in calculating the average market yield rate for this purpose, the Treasury incorporates the yield to the call date when a callable bond's market price is above par.

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[1] The additional tax revenues resulting from the increase to 85 percent are transferred to the HI Trust Fund.

[2] A special provision applies to benefits paid to nonresident aliens. Under Public Law 103-465, effective for taxable years beginning after 1994, a flat-rate tax, usually 25.5 percent, is withheld from the benefits before they are paid and, therefore, remains in the trust funds. From 1984 to 1994 the flat-rate tax that was withheld was usually 15 percent.

Although the special issues cannot be bought or sold in the open market, they are nonetheless redeemable at any time at par value and thus bear no risk of fluctuations in principal value due to changes in market yield rates. Just as in the case of marketable Treasury securities held by the public, all of the investments held by the trust funds are backed by the full faith and credit of the U.S. Government.

Income is also affected by provisions of the Social Security Act for (1) transfers between the General Fund of the Treasury and the OASI and DI Trust Funds for any adjustments to prior payments for the cost arising from the granting of noncontributory wage credits for military service prior to 1957, according to periodic determinations; (2) annual reimbursements from the General Fund of the Treasury to the OASI Trust Fund for any costs arising from the special monthly cash payments to certain uninsured persons—i.e., those who attained age 72 before 1968 and who generally are not eligible for cash benefits under other provisions of the OASDI program; and (3) the receipt of unconditional money gifts or bequests made for the benefit of the trust funds or any activity financed through the funds.

The primary expenditures of the OASI and DI Trust Funds are for (1) OASDI benefit payments, net of any reimbursements from the General Fund of the Treasury for unnegotiated benefit checks, and (2) expenses incurred by the Social Security Administration and the Department of the Treasury in administering the OASDI program and the provisions of the Internal Revenue Code relating to the collection of contributions. Such administrative expenses include expenditures for construction, rental and lease, or purchase of office buildings and related facilities for the Social Security Administration. The Social Security Act does not permit expenditures from the OASI and DI Trust Funds for any purpose not related to the payment of benefits or administrative costs for the OASDI program.

The expenditures of the trust funds also include (1) the costs of vocational rehabilitation services furnished as an additional benefit to disabled persons receiving cash benefits because of their disabilities where such services contributed to their successful rehabilitation, and (2) net costs resulting from the provisions of the Railroad Retirement Act which provide for a system of coordination and financial interchange between the Railroad Retirement program and the Social Security program. Under the latter provisions, transfers between the Railroad Retirement program's Social Security Equivalent Benefit Account and the trust funds are made on an annual basis in order to place each trust fund in the same position in which it would have been if railroad employment had always been covered under Social Security.

The net worth of facilities and other fixed capital assets is not carried in the statements of the operations of the trust funds presented in this report. This is because the value of fixed capital assets is not available in the form of a financial asset redeemable for the payment of benefits or administrative expenditures, and therefore is not considered in assessing the actuarial status of the trust funds.

Table VI.A2.—Historical Operations of the OASI Trust Fund, Calendar Years 1937-2002
[Amounts in billions]

	Income				Expenditures				Assets		
Calendar year	Total[1]	Net contributions[2]	Taxation of benefits	Net interest[3]	Total	Benefit payments[4]	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust Fund ratio[5]
1937 . . .	$0.8	$0.8	—	6/	6/	6/	—	—	$0.8	$0.8	100
1938 . . .	.4	.4	—	6/	6/	6/	—	—	.4	1.1	7,660
1939 . . .	.6	.6	—	6/	6/	6/	—	—	.6	1.7	8,086
1940 . . .	.4	.3	—	6/	$0.1	6/	6/	—	.3	2.0	2,781
1941 . . .	.8	.8	—	$0.1	.1	$0.1	6/	—	.7	2.8	1,782
1942 . . .	1.1	1.0	—	.1	.2	.1	6/	—	.9	3.7	1,737
1943 . . .	1.3	1.2	—	.1	.2	.2	6/	—	1.1	4.8	1,891
1944 . . .	1.4	1.3	—	.1	.2	.2	6/	—	1.2	6.0	2,025
1945 . . .	1.4	1.3	—	.1	.3	.3	6/	—	1.1	7.1	1,975
1946 . . .	1.4	1.3	—	.2	.4	.4	6/	—	1.0	8.2	1,704
1947 . . .	1.7	1.6	—	.2	.5	.5	6/	—	1.2	9.4	1,592
1948 . . .	2.0	1.7	—	.3	.6	.6	$0.1	—	1.4	10.7	1,542
1949 . . .	1.8	1.7	—	.1	.7	.7	.1	—	1.1	11.8	1,487
1950 . . .	2.9	2.7	—	.3	1.0	1.0	.1	—	1.9	13.7	1,156
1951 . . .	3.8	3.4	—	.4	2.0	1.9	.1	—	1.8	15.5	698
1952 . . .	4.2	3.8	—	.4	2.3	2.2	.1	—	1.9	17.4	681
1953 . . .	4.4	3.9	—	.4	3.1	3.0	.1	—	1.3	18.7	564
1954 . . .	5.6	5.2	—	.4	3.7	3.7	.1	6/	1.9	20.6	500
1955 . . .	6.2	5.7	—	.5	5.1	5.0	.1	6/	1.1	21.7	405
1956 . . .	6.7	6.2	—	.5	5.8	5.7	.1	6/	.9	22.5	371
1957 . . .	7.4	6.8	—	.6	7.5	7.3	.2	6/	-.1	22.4	300
1958 . . .	8.1	7.6	—	.6	8.6	8.3	.2	$0.1	-.5	21.9	259
1959 . . .	8.6	8.1	—	.5	10.3	9.8	.2	.3	-1.7	20.1	212
1960 . . .	11.4	10.9	—	.5	11.2	10.7	.2	.3	.2	20.3	180
1961 . . .	11.8	11.3	—	.5	12.4	11.9	.2	.3	-.6	19.7	163
1962 . . .	12.6	12.1	—	.5	14.0	13.4	.3	.4	-1.4	18.3	141
1963 . . .	15.1	14.5	—	.5	14.9	14.2	.3	.4	.1	18.5	123
1964 . . .	16.3	15.7	—	.6	15.6	14.9	.3	.4	.6	19.1	118
1965 . . .	16.6	16.0	—	.6	17.5	16.7	.3	.4	-.9	18.2	109
1966 . . .	21.3	20.6	—	.6	19.0	18.3	.3	.4	2.3	20.6	96
1967 . . .	24.0	23.1	—	.8	20.4	19.5	.4	.5	3.7	24.2	101
1968 . . .	25.0	23.7	—	.9	23.6	22.6	.5	.4	1.5	25.7	103
1969 . . .	29.6	27.9	—	1.2	25.2	24.2	.5	.5	4.4	30.1	102
1970 . . .	32.2	30.3	—	1.5	29.8	28.8	.5	.6	2.4	32.5	101
1971 . . .	35.9	33.7	—	1.7	34.5	33.4	.5	.6	1.3	33.8	94
1972 . . .	40.1	37.8	—	1.8	38.5	37.1	.7	.7	1.5	35.3	88
1973 . . .	48.3	46.0	—	1.9	47.2	45.7	.6	.8	1.2	36.5	75
1974 . . .	54.7	52.1	—	2.2	53.4	51.6	.9	.9	1.3	37.8	68
1975 . . .	59.6	56.8	—	2.4	60.4	58.5	.9	1.0	-.8	37.0	63
1976 . . .	66.3	63.4	—	2.3	67.9	65.7	1.0	1.2	-1.6	35.4	54
1977 . . .	72.4	69.6	—	2.2	75.3	73.1	1.0	1.2	-2.9	32.5	47
1978 . . .	78.1	75.5	—	2.0	83.1	80.4	1.1	1.6	-5.0	27.5	39
1979 . . .	90.3	87.9	—	1.8	93.1	90.6	1.1	1.4	-2.9	24.7	30

Table VI.A2.—Historical Operations of the OASI Trust Fund, Calendar Years 1937-2002 (Cont.)

[Amounts in billions]

	Income				Expenditures				Assets		
Calendar year	Total[1]	Net contributions[2]	Taxation of benefits	Net interest[3]	Total	Benefit payments[4]	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust Fund ratio[5]
1980 . . .	$105.8	$103.4	—	$1.8	$107.7	$105.1	$1.2	$1.4	-$1.8	$22.8	23
1981 . . .	125.4	122.6	—	2.1	126.7	123.8	1.3	1.6	-1.3	21.5	18
1982 . . .	125.2	123.7	—	.8	142.1	138.8	1.5	1.8	.6	22.1	15
1983 . . .	150.6	138.3	—	6.7	153.0	149.2	1.5	2.3	-2.4	19.7	14
1984 . . .	169.3	164.1	$2.8	2.3	161.9	157.8	1.6	2.4	7.4	27.1	20
1985 . . .	184.2	177.0	3.2	1.9	171.2	167.2	1.6	2.3	[7]8.7	35.8	24
1986 . . .	197.4	190.7	3.4	3.1	181.0	176.8	1.6	2.6	[7] 3.2	39.1	28
1987 . . .	210.7	202.7	3.3	4.7	187.7	183.6	1.5	2.6	23.1	62.1	30
1988 . . .	240.8	229.8	3.4	7.6	200.0	195.5	1.8	2.8	40.8	102.9	41
1989 . . .	264.7	250.2	2.4	12.0	212.5	208.0	1.7	2.8	52.2	155.1	59
1990 . . .	286.7	267.5	4.8	16.4	227.5	223.0	1.6	3.0	59.1	214.2	78
1991 . . .	299.3	272.6	5.9	20.8	245.6	240.5	1.8	3.4	53.7	267.8	87
1992 . . .	311.2	281.0	5.9	24.3	259.9	254.9	1.8	3.1	51.3	319.2	103
1993 . . .	323.3	290.9	5.3	27.0	273.1	267.8	2.0	3.4	50.2	369.3	117
1994 . . .	328.3	293.3	5.0	29.9	284.1	279.1	1.6	3.4	44.1	413.5	130
1995 . . .	342.8	304.6	5.5	32.8	297.8	291.6	2.1	4.1	45.0	458.5	139
1996 . . .	363.7	321.6	6.5	35.7	308.2	302.9	1.8	3.6	55.5	514.0	149
1997 . . .	397.2	349.9	7.4	39.8	322.1	316.3	2.1	3.7	75.1	589.1	160
1998 . . .	424.8	371.2	9.1	44.5	332.3	326.8	1.9	3.7	92.5	681.6	177
1999 . . .	457.0	396.4	10.9	49.8	339.9	334.4	1.8	3.7	117.2	798.8	201
2000 . . .	490.5	421.4	11.6	57.5	358.3	352.7	2.1	3.5	132.2	931.0	223
2001 . . .	518.1	441.5	11.9	64.7	377.5	372.3	2.0	3.3	140.6	1,071.5	247
2002 . . .	539.7	455.2	12.9	71.2	393.7	388.1	2.1	3.5	146.0	1,217.5	272

[1] Includes payments from the General Fund of the Treasury to the trust funds for (1) in 1947-51 and in 1966 and later, costs of noncontributory wage credits for military service performed before 1957; (2) in 1971-82, costs of deemed wage credits for military service performed after 1956; and (3) in 1968 and later, costs of benefits to certain uninsured persons who attained age 72 before 1968. Differences in past year total income and sum of individual column amounts are due to these payments. OASI historical payments from the General Fund of the Treasury may be found on the Internet at http://www.ssa.gov/OACT/STATS/t4a1Income.html.

[2] Beginning in 1983, includes transfers from the General Fund of the Treasury representing contributions that would have been paid on deemed wage credits for military service in 1957 through 2001, if such credits were considered to be covered wages.

[3] Net interest includes net profits or losses on marketable investments. Beginning in 1967, administrative expenses are charged to the trust fund on an estimated basis, with a final adjustment, including interest, made in the following fiscal year. The amounts of these interest adjustments are included in net interest. For years prior to 1967, a description of the method of accounting for administrative expenses is contained in the 1970 Annual Report. Beginning in October 1973, the figures shown include relatively small amounts of gifts to the fund. Net interest for 1983-86 reflects payments from a borrowing trust fund to a lending trust fund for interest on amounts owed under the interfund borrowing provisions. During 1983-90, interest paid from the trust fund to the general fund on advance tax transfers is reflected. The amount shown for 1985 includes an interest adjustment of $88 million on unnegotiated checks issued before April 1985.

[4] Beginning in 1966, includes payments for vocational rehabilitation services furnished to disabled persons receiving benefits because of their disabilities. Beginning in 1983, amounts are reduced by amount of reimbursement for unnegotiated benefit checks.

[5] The "Trust fund ratio" column represents assets at the beginning of a year as a percentage of expenditures during the year. For years 1984-90, assets at the beginning of a year include January advance tax transfers.

[6] Less than $50 million.

[7] Reflects offset for repayment from the OASI Trust Fund of amounts borrowed from the DI and HI Trust Funds in 1982. The amount repaid in 1985 was $4.4 billion; in 1986, the amount was $13.2 billion.

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

Table VI.A3.—Historical Operations of the DI Trust Fund, Calendar Years 1957-2002
[Amounts in billions]

	Income				Expenditures				Assets		
Calendar year	Total [1]	Net contributions[2]	Taxation of benefits	Net interest[3]	Total	Benefit payments[4]	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust Fund ratio[5]
1957...	$0.7	$0.7	—	6/	$0.1	$0.1	6/	—	$0.6	$0.6	100
1958...	1.0	1.0	—	6/	.3	.2	6/	—	.7	1.4	249
1959...	.9	.9	—	6/	.5	.5	$0.1	6/	.4	1.8	284
1960...	1.1	1.0	—	$0.1	.6	.6	6/	6/	.5	2.3	304
1961...	1.1	1.0	—	.1	1.0	.9	.1	6/	.1	2.4	239
1962...	1.1	1.0	—	.1	1.2	1.1	.1	6/	-.1	2.4	206
1963...	1.2	1.1	—	.1	1.3	1.2	.1	6/	-.1	2.2	183
1964...	1.2	1.2	—	.1	1.4	1.3	.1	6/	-.2	2.0	159
1965...	1.2	1.2	—	.1	1.7	1.6	.1	6/	-.4	1.6	121
1966...	2.1	2.0	—	.1	1.9	1.8	.1	6/	.1	1.7	82
1967...	2.4	2.3	—	.1	2.1	2.0	.1	6/	.3	2.0	83
1968...	3.5	3.3	—	.1	2.5	2.3	.1	6/	1.0	3.0	83
1969...	3.8	3.6	—	.2	2.7	2.6	.1	6/	1.1	4.1	111
1970...	4.8	4.5	—	.3	3.3	3.1	.2	6/	1.5	5.6	126
1971...	5.0	4.6	—	.4	4.0	3.8	.2	6/	1.0	6.6	140
1972...	5.6	5.1	—	.4	4.8	4.5	.2	6/	.8	7.5	140
1973...	6.4	5.9	—	.5	6.0	5.8	.2	6/	.5	7.9	125
1974...	7.4	6.8	—	.5	7.2	7.0	.2	6/	.2	8.1	110
1975...	8.0	7.4	—	.5	8.8	8.5	.3	6/	-.8	7.4	92
1976...	8.8	8.2	—	.4	10.4	10.1	.3	6/	-1.6	5.7	71
1977...	9.6	9.1	—	.3	11.9	11.5	.4	6/	-2.4	3.4	48
1978...	13.8	13.4	—	.3	13.0	12.6	.3	6/	.9	4.2	26
1979...	15.6	15.1	—	.4	14.2	13.8	.4	6/	1.4	5.6	30
1980...	13.9	13.3	—	.5	15.9	15.5	.4	6/	-2.0	3.6	35
1981...	17.1	16.7	—	.2	17.7	17.2	.4	6/	-.6	3.0	21
1982...	22.7	22.0	—	.5	18.0	17.4	.6	6/	-.4	2.7	17
1983...	20.7	18.0	—	1.6	18.2	17.5	.6	6/	2.5	5.2	15
1984...	17.3	15.9	$0.2	1.2	18.5	17.9	.6	6/	-1.2	4.0	35
1985...	19.3	17.2	.2	.9	19.5	18.8	.6	6/	[7]2.4	6.3	27
1986...	19.4	18.4	.2	.8	20.5	19.9	.6	$0.1	[7] 1.5	7.8	38
1987...	20.3	19.7	6/	.6	21.4	20.5	.8	.1	-1.1	6.7	44
1988...	22.7	22.0	.1	.6	22.5	21.7	.7	.1	.2	6.9	38
1989...	24.8	24.0	.1	.7	23.8	22.9	.8	.1	1.0	7.9	38
1990...	28.8	28.5	.1	.9	25.6	24.8	.7	.1	3.2	11.1	40
1991...	30.4	29.1	.2	1.1	28.6	27.7	.8	.1	1.8	12.9	39
1992...	31.4	30.1	.2	1.1	32.0	31.1	.8	.1	-.6	12.3	40
1993...	32.3	31.2	.3	.8	35.7	34.6	1.0	.1	-3.4	9.0	35
1994...	52.8	51.4	.3	1.2	38.9	37.7	1.0	.1	14.0	22.9	23
1995...	56.7	54.4	.3	2.2	42.1	40.9	1.1	.1	14.6	37.6	55
1996...	60.7	57.3	.4	3.0	45.4	44.2	1.2	6/	15.4	52.9	83
1997...	60.5	56.0	.5	4.0	47.0	45.7	1.3	.1	13.5	66.4	113
1998...	64.4	59.0	.6	4.8	49.9	48.2	1.6	.2	14.4	80.8	133
1999...	69.5	63.2	.7	5.7	53.0	51.4	1.5	.1	16.5	97.3	152
2000...	77.9	71.1	.7	6.9	56.8	55.0	1.6	.2	21.1	118.5	171
2001...	83.9	74.9	.8	8.2	61.4	59.6	1.7	6/	22.5	141.0	193
2002...	87.4	77.3	.9	9.2	67.9	65.7	2.0	.2	19.5	160.5	208

[1] Includes payments from the General Fund of the Treasury to the trust funds for (1) beginning in 1966 and later, costs of noncontributory wage credits for military service performed before 1957 and (2) in 1971-82, costs of deemed wage credits for military service performed after 1956. Differences in past year total income and sum of individual column amounts are due to these payments. DI historical payments from the General Fund of the Treasury may be found on the Internet at http://www.ssa.gov/OACT/STATS/t4a2Income.html.

[2] Beginning in 1983, includes transfers from the General Fund of the Treasury representing contributions that would have been paid on deemed wage credits for military service in 1957 through 2001, if such credits were considered to be covered wages.
[3] Net interest includes net profits or losses on marketable investments. Beginning in 1967, administrative expenses are charged to the trust fund on an estimated basis, with a final adjustment, including interest, made in the following fiscal year. The amounts of these interest adjustments are included in net interest. For years prior to 1967, a description of the method of accounting for administrative expenses is contained in the 1970 Annual Report. Beginning in July 1974, the figures shown include relatively small amounts of gifts to the fund. Net interest for 1983-86 reflects payments from a borrowing trust fund to a lending trust fund for interest on amounts owed under the interfund borrowing provisions. During 1983-90, interest paid from the trust fund to the general fund on advance tax transfers is reflected. The amount shown for 1985 includes an interest adjustment of $14.8 million on unnegotiated checks issued before April 1985.
[4] Beginning in 1966, includes payments for vocational rehabilitation services furnished to disabled persons receiving benefits because of their disabilities. Beginning in 1983, amounts are reduced by amount of reimbursement for unnegotiated benefit checks.
[5] The "Trust fund ratio" column represents assets at the beginning of a year as a percentage of expenditures during the year. For years 1984-90, assets at the beginning of a year include January advance tax transfers.
[6] Less than $50 million.
[7] Reflects offset for repayment from the OASI Trust Fund of amounts borrowed from the DI Trust Fund in 1982. An amount of $2.5 billion was repaid in each year 1985 and 1986.

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

Table VI.A4.—Historical Operations of the Combined OASI and DI Trust Funds, Calendar Years 1957-2002
[Amounts in billions]

	Income				Expenditures				Assets		
Calendar year	Total[1]	Net contributions[2]	Taxation of benefits	Net interest[3]	Total	Benefit payments[4]	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust Fund ratio[5]
1957 . . .	$8.1	$7.5	—	$0.6	$7.6	$7.4	$0.2	[6]	$0.5	$23.0	298
1958 . . .	9.1	8.5	—	.6	8.9	8.6	.2	$0.1	.2	23.2	259
1959 . . .	9.5	8.9	—	.6	10.8	10.3	.2	.3	-1.3	22.0	215
1960 . . .	12.4	11.9	—	.6	11.8	11.2	.2	.3	.6	22.6	186
1961 . . .	12.9	12.3	—	.6	13.4	12.7	.3	.3	-.5	22.2	169
1962 . . .	13.7	13.1	—	.6	15.2	14.5	.3	.4	-1.5	20.7	146
1963 . . .	16.2	15.6	—	.6	16.2	15.4	.3	.4	[6]	20.7	128
1964 . . .	17.5	16.8	—	.6	17.0	16.2	.4	.4	.5	21.2	122
1965 . . .	17.9	17.2	—	.7	19.2	18.3	.4	.5	-1.3	19.8	110
1966 . . .	23.4	22.6	—	.7	20.9	20.1	.4	.5	2.5	22.3	95
1967 . . .	26.4	25.4	—	.9	22.5	21.4	.5	.5	3.9	26.3	99
1968 . . .	28.5	27.0	—	1.0	26.0	25.0	.6	.5	2.5	28.7	101
1969 . . .	33.3	31.5	—	1.3	27.9	26.8	.6	.5	5.5	34.2	103
1970 . . .	37.0	34.7	—	1.8	33.1	31.9	.6	.6	3.9	38.1	103
1971 . . .	40.9	38.3	—	2.0	38.5	37.2	.7	.6	2.4	40.4	99
1972 . . .	45.6	42.9	—	2.2	43.3	41.6	.9	.7	2.3	42.8	93
1973 . . .	54.8	51.9	—	2.4	53.1	51.5	.8	.8	1.6	44.4	80
1974 . . .	62.1	58.9	—	2.7	60.6	58.6	1.1	.9	1.5	45.9	73
1975 . . .	67.6	64.3	—	2.9	69.2	67.0	1.2	1.0	-1.5	44.3	66
1976 . . .	75.0	71.6	—	2.7	78.2	75.8	1.2	1.2	-3.2	41.1	57
1977 . . .	82.0	78.7	—	2.5	87.3	84.7	1.4	1.2	-5.3	35.9	47
1978 . . .	91.9	88.9	—	2.3	96.0	93.0	1.4	1.6	-4.1	31.7	37
1979 . . .	105.9	103.0	—	2.2	107.3	104.4	1.5	1.5	-1.5	30.3	30
1980 . . .	119.7	116.7	—	2.3	123.6	120.6	1.5	1.4	-3.8	26.5	25
1981 . . .	142.4	139.4	—	2.2	144.4	141.0	1.7	1.6	-1.9	24.5	18
1982 . . .	147.9	145.7	—	1.4	160.1	156.2	2.1	1.8	.2	24.8	15
1983 . . .	171.3	156.3	—	8.3	171.2	166.7	2.2	2.3	.1	24.9	14
1984 . . .	186.6	180.1	$3.0	3.4	180.4	175.7	2.3	2.4	6.2	31.1	21
1985 . . .	203.5	194.1	3.4	2.7	190.6	186.1	2.2	2.4	[7]11.1	42.2	24
1986 . . .	216.8	209.1	3.7	3.9	201.5	196.7	2.2	2.7	[7] 4.7	46.9	29
1987 . . .	231.0	222.4	3.2	5.3	209.1	204.1	2.4	2.6	21.9	68.8	31
1988 . . .	263.5	251.8	3.4	8.2	222.5	217.1	2.5	2.9	41.0	109.8	41
1989 . . .	289.4	274.2	2.5	12.7	236.2	230.9	2.4	2.9	53.2	163.0	57
1990 . . .	315.4	296.1	5.0	17.2	253.1	247.8	2.3	3.0	62.3	225.3	75
1991 . . .	329.7	301.7	6.1	21.9	274.2	268.2	2.6	3.5	55.5	280.7	82
1992 . . .	342.6	311.1	6.1	25.4	291.9	286.0	2.7	3.2	50.7	331.5	96
1993 . . .	355.6	322.1	5.6	27.9	308.8	302.4	3.0	3.4	46.8	378.3	107
1994 . . .	381.1	344.7	5.3	31.1	323.0	316.8	2.7	3.5	58.1	436.4	117
1995 . . .	399.5	359.0	5.8	35.0	339.8	332.6	3.1	4.1	59.7	496.1	128
1996 . . .	424.5	378.9	6.8	38.7	353.6	347.1	3.0	3.6	70.9	567.0	140
1997 . . .	457.7	406.0	7.9	43.8	369.1	362.0	3.4	3.7	88.6	655.5	154
1998 . . .	489.2	430.2	9.7	49.3	382.3	375.0	3.5	3.8	107.0	762.5	171
1999 . . .	526.6	459.6	11.6	55.5	392.9	385.8	3.3	3.8	133.7	896.1	194
2000 . . .	568.4	492.5	12.3	64.5	415.1	407.6	3.8	3.7	153.3	1,049.4	216
2001 . . .	602.0	516.4	12.7	72.9	438.9	431.9	3.7	3.3	163.1	1,212.5	239
2002 . . .	627.1	532.5	13.8	80.4	461.7	453.8	4.2	3.6	165.4	1,378.0	263

[1] Includes payments from the General Fund of the Treasury to the trust funds for (1) beginning in 1966 and later, costs of noncontributory wage credits for military service performed before 1957; (2) in 1971-82, costs of deemed wage credits for military service performed after 1956; and (3) in 1968 and later, costs of benefits to certain uninsured persons who attained age 72 before 1968. Differences in past year total income and sum of individual column amounts are due to these payments. OASDI historical payments from the General Fund of the Treasury may be found on the Internet at http://www.ssa.gov/OACT/STATS/t4a3Income.html.
[2] Beginning in 1983, includes transfers from the General Fund of the Treasury representing contributions that would have been paid on deemed wage credits for military service in 1957 through 2001, if such credits were considered to be covered wages.
[3] Net interest includes net profits or losses on marketable investments. Beginning in 1967, administrative expenses are charged to the trust funds on an estimated basis, with a final adjustment, including interest, made in the following fiscal year. The amounts of these interest adjustments are included in net interest. For years prior to 1967, a description of the method of accounting for administrative expenses is contained in the 1970 Annual Report. Beginning in October 1973, the figures shown include relatively small amounts of gifts to the funds. Net interest for 1983-86 reflects payments from a borrowing trust fund to a lending trust fund for interest on amounts owed under the interfund borrowing provisions. During 1983-90, interest paid from the trust funds to the general fund on advance tax transfers is reflected. The amount shown for 1985 includes an interest adjustment of $102.8 million on unnegotiated checks issued before April 1985.
[4] Beginning in 1966, includes payments for vocational rehabilitation services furnished to disabled persons receiving benefits because of their disabilities. Beginning in 1983, amounts are reduced by amount of reimbursement for unnegotiated benefit checks.
[5] The "Trust fund ratio" column represents assets at the beginning of a year as a percentage of expenditures during the year. For years 1984-90, assets at the beginning of a year include January advance tax transfers.
[6] Less than $50 million.
[7] Reflects offset for repayment from the OASI Trust Fund of amounts borrowed from the HI Trust Fund in 1982. The amount repaid in 1985 was $1.8 billion; in 1986, the amount was $10.6 billion.

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

B. HISTORY OF ACTUARIAL BALANCE ESTIMATES

This appendix chronicles the history of the principal summary measure of long-range actuarial status, namely the actuarial balance, since 1983. The 1983 report was the last report for which the actuarial balance was positive. Actuarial balance is defined in detail in chapter IV, Actuarial Estimates. Conceptually, the two basic components of actuarial balance are the summarized income rate and the summarized cost rate. Both rates are expressed as percentages of taxable payroll. For any given period, the actuarial balance is the difference between the present value of tax income for the period, and the present value of the cost for the period, each divided by the present value of taxable payroll for all years in the period. Also included in the calculation of the actuarial balance are:

- The amount of the trust fund balances on hand at the beginning of the valuation period, as shown in the reports for 1988 and later, and
- The present value of a target trust fund balance equal to 100 percent of the amount of annual cost to be reached and maintained by the end of the valuation period, as shown in the reports for 1991 and later.

It should be noted that the current method of calculating the actuarial balance based on present values, though used prior to the 1973 Annual Report, was not used for the annual reports of 1973-87. Instead, a simpler method that approximates the results of the present-value approach, called the average-cost method, was used during that period. Under the average-cost method, the sum of the annual cost rates (which are expressed as percentages of taxable payroll) over the 75-year projection period was divided by the total number of years, 75, to obtain the average cost rate per year. The average income rate was similarly calculated, and the difference between the average income rate and the average cost rate was called the actuarial balance.

In 1973, when the average-cost method was first used, the long-range financing of the program was more nearly on a pay-as-you-go basis. Also, based on the long-range demographic and economic assumptions then being used, the annual rate of growth in taxable payroll was about the same as the annual rate at which the trust funds earned interest. In either situation (i.e., pay-as-you-go financing, where the annual income rate is the same as the annual cost rate, or an annual rate of growth in taxable payroll equal to the annual interest rate), the average-cost method produces the same result as the present-value method. However, by 1988, neither of these situations still existed.

As a result of legislation enacted in 1977 and in 1983, substantial increases in the trust funds were estimated to occur well into the 21st century, so that the program was partially advance funded, rather than being funded on a pay-as-you-go basis. Also, because of reductions in long-range fertility rates and average real-wage growth that were assumed in the annual reports over the period 1973-87, the annual rate of growth in taxable earnings assumed for the long range became significantly lower than the assumed interest rate. Therefore, during the period 1973-87, the results of the average-cost method and the present-value method began to diverge, and by 1988 they were quite different. While the average-cost method still accounted for most of the effects of the assumed interest rate, it no longer accounted for all of the interest effects. The present-value method, of course, does account for the full effect of the assumed interest rates. So, in 1988, the present-value method of calculating the actuarial balance was reintroduced.

A positive actuarial balance indicates that estimated income is more than sufficient to meet estimated trust fund obligations for the period as a whole. A negative actuarial balance indicates that estimated income is insufficient to meet estimated trust fund obligations for the entire period. An actuarial balance of zero indicates that the estimated income exactly matches estimated trust fund obligations for the period.

Table VI.B1 shows the estimated OASDI actuarial balances, as well as the summarized income and cost rates, for the annual reports 1983-2002, along with the estimates for the current report. The values shown are based on the alternative II assumptions, or alternative II-B for years prior to 1991.

Table VI.B1.—Long-Range OASDI Actuarial Balances [1] as Shown in the Trustees Reports for 1983-2003
[As a percentage of taxable payroll]

Year of report	Summarized income rate	Summarized cost rate	Actuarial balance	Change from previous year
1983	12.87	12.84	+0.02	+1.84
1984	12.90	12.95	-.06	-.08
1985	12.94	13.35	-.41	-.35
1986	12.96	13.40	-.44	-.03
1987	12.89	13.51	-.62	-.18
1988	12.94	13.52	-.58	+.04
1989	13.02	13.72	-.70	-.13
1990	13.04	13.95	-.91	-.21
1991	13.11	14.19	-1.08	-.17
1992	13.16	14.63	-1.46	-.38
1993	13.21	14.67	-1.46	2/
1994	13.24	15.37	-2.13	-.66
1995	13.27	15.44	-2.17	-.04
1996	13.33	15.52	-2.19	-.02
1997	13.37	15.60	-2.23	-.03
1998	13.45	15.64	-2.19	+.04
1999	13.49	15.56	-2.07	+.12
2000	13.51	15.40	-1.89	+.17
2001	13.58	15.44	-1.86	+.03
2002	13.72	15.59	-1.87	-.01
2003	13.78	15.70	-1.92	-.04

[1] Values shown are based on the alternative II assumptions for 1991-2003, and on the alternative II-B assumptions for 1982-90.
[2] Between -0.005 and 0.005 percent of taxable payroll.
Note: Totals do not necessarily equal the sums of rounded components.

For several of the years included in the table, significant legislative changes or definitional changes affected the estimated actuarial balance. The Social Security Amendments of 1983 accounted for the largest single change in recent history. The actuarial balance of -1.82 for the 1982 report improved to +0.02 for the 1983 report. In 1985, the estimated actuarial balance changed largely because of an adjustment made to the method for estimating the age distribution of immigrants.

Rebenchmarking of the National Income and Product Accounts and changes in demographic assumptions contributed to the change in the actuarial balance for 1987. Various changes in assumptions and methods for the 1988 report had roughly offsetting effects on the actuarial balance. In 1989 and 1990, changes in economic assumptions accounted for most of the changes in the estimated actuarial balance. In 1991, the effect of legislation, changes in economic assumptions, and the introduction of the cost of reaching and maintaining an ending trust fund target combined to produce the change in the actuarial balance. In 1992, changes in disability assumptions and the

method for projecting average benefit levels accounted for most of the change in the actuarial balance. In 1993, numerous small changes in assumptions and methods had offsetting effects on the actuarial balance. In 1994, changes in the real-wage assumptions, disability rates, and the earnings sample used for projecting average benefit levels accounted for most of the change in the actuarial balance. In 1995, numerous small changes had largely offsetting effects on the actuarial balance, including a substantial reallocation of the payroll tax rate, which reduced the OASI actuarial balance, but increased the DI actuarial balance. In 1996, a change in the method of projecting dually-entitled beneficiaries produced a large increase in the actuarial balance, which almost totally offset decreases produced by changes in the valuation period and in the demographic and economic assumptions. Various changes in assumptions and methods for the 1997 report had roughly offsetting effects on the actuarial balance. In 1998, increases caused by changes in the economic assumptions, although partially offset by decreases produced by changes in the valuation period and in the demographic assumptions, accounted for most of the changes in the estimated actuarial balance. In 1999, increases caused by changes in the economic assumptions related to improvements in the CPI by the Bureau of Labor Statistics accounted for most of the changes in the estimated actuarial balance. For the 2000 report, changes in the actuarial balance resulted from changes in economic assumptions and methodology; however, these increases in the balance were partially offset by reductions caused by the change in valuation period and changes in demographic assumptions. For the 2001 report, increases caused by changes in the demographic starting values, although partially offset by a decrease produced by the change in the valuation period, accounted for most of the changes in the estimated actuarial balance. For the 2002 report, the changes in the valuation period and the demographic assumptions—both decreases in the actuarial balance—were offset by changes in the economic assumptions, while the increase due to disability assumptions was slightly more than offset by the decrease due to changes in the projection methods and data. Changes affecting the actuarial balance shown for the 2003 report are described in section IV.B.8.

C. FISCAL YEAR HISTORICAL DATA AND PROJECTIONS THROUGH 2012

Tables VI.C1, VI.C2, and VI.C3 present detailed operations of the OASI, DI, and the combined OASI and DI Trust Funds, respectively, for fiscal year 2002, the most recent fiscal year for which complete actual information is available. These tables are similar to the calendar year operations tables in section III.A. Please see that section for a description of the various items of income and outgo.

Table VI.C1.—Operations of the OASI Trust Fund, Fiscal Year 2002
[In millions]

Total assets, September 30, 2001		$1,033,840
Receipts:		
Contributions:		
Employment taxes	$448,991	
Payments from the General Fund of the Treasury for contributions subject to refund	-858	
Net contributions		448,133
Income based on taxation of benefit payments:		
Withheld from benefit payments to nonresident aliens	145	
All other, not subject to withholding	12,452	
Total income from taxation of benefits		12,597
Transfer from General Fund of the Treasury to adjust previous determinations of costs attributable to noncontributory wage credits for military service before 1957		414
Investment income and interest adjustments:		
Interest on investments	68,105	
Interest adjustments[1]	8	
Total investment income and interest adjustments		68,113
Gifts		2/
Total receipts		529,257
Disbursements:		
Benefit payments:		
Gross benefit payments	385,119	
Offset for collected overpayments	-1,128	
Reimbursement from the general fund for unnegotiated checks	-50	
Net benefit payments		383,942
Transfer to the Railroad Retirement "Social Security Equivalent Benefit Account"		3,493
Administrative expenses:		
Costs incurred by:		
Social Security Administration	1,893	
Department of the Treasury	225	
Offsetting receipts from sales of supplies, materials, etc.	-1	
Miscellaneous reimbursements from the general fund[3]	-5	
Net administrative expenses		2,111
Total disbursements		389,546
Net increase in assets		139,711
Total assets, September 30, 2002		1,173,551

[1] Includes (1) interest on transfers between the trust fund and the general fund account for the Supplemental Security Income program due to adjustments in the allocation of administrative expenses, (2) interest arising from the revised allocation of administrative expenses among the trust funds and (3) interest on reimbursements to the trust fund for costs associated with union activities and pension reform.
[2] Less than $500,000.
[3] Reimbursements for costs incurred in performing certain legislatively mandated activities not directly related to administering the OASI program.

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

Table VI.C2.—Operations of the DI Trust Fund, Fiscal Year 2002
[In millions]

Total assets, September 30, 2001		$135,901
Receipts:		
Contributions:		
Employment taxes	$76,220	
Payments from the General Fund of the Treasury for contributions subject to refund	-152	
Net contributions		76,067
Income based on taxation of benefit payments:		
Withheld from benefit payments to nonresident aliens	6	
All other, not subject to withholding	930	
Total income from taxation of benefits		936
Investment income and interest adjustments:		
Interest on investments	8,714	
Interest adjustments[1]	3	
Total investment income and interest adjustments		8,717
Total receipts		85,720
Disbursements:		
Benefit payments:		
Gross benefit payments	64,569	
Offset for collected overpayments	-413	
Reimbursement from the general fund for unnegotiated checks	-18	
Net benefit payments		64,138
Transfer to the Railroad Retirement "Social Security Equivalent Benefit Account"		154
Payment for costs of vocational rehabilitation services for disabled beneficiaries		67
Administrative expenses:		
Costs incurred by:		
Social Security Administration	1,966	
Department of the Treasury	42	
Miscellaneous reimbursements from the general fund[2]	-3	
Net administrative expenses		2,005
Total disbursements		66,364
Net increase in assets		19,356
Total assets, September 30, 2002		155,258

[1] Includes (1) interest on transfers between the trust fund and the general fund account for the Supplemental Security Income program due to adjustments in the allocation of administrative expenses, (2) interest arising from the revised allocation of administrative expenses among the trust funds, (3) interest earned on the investments of the trust fund, and (4) interest on reimbursements to the trust fund for costs associated with union activities and pension reform.

[2] Reimbursements for costs incurred in performing certain legislatively mandated activities not directly related to administering the DI program.

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

Table VI.C3.—Operations of the Combined OASI and DI Trust Funds, Fiscal Year 2002
[In millions]

Total assets, September 30, 2001		$1,169,741
Receipts:		
Contributions:		
Employment taxes	$525,211	
Payments from the General Fund of the Treasury for contributions subject to refund	-1,011	
Net contributions		524,200
Income based on taxation of benefit payments:		
Withheld from benefit payments to nonresident aliens	151	
All other, not subject to withholding	13,382	
Total income from taxation of benefits		13,533
Transfer from General Fund of the Treasury to adjust previous determinations of costs attributable to noncontributory wage credits for military service before 1957		414
Investment income and interest adjustments:		
Interest on investments	76,819	
Interest adjustments[1]	10	
Total investment income and interest adjustments		76,830
Gifts		2/
Total receipts		614,977
Disbursements:		
Benefit payments:		
Gross benefit payments	449,688	
Offset for collected overpayments	-1,540	
Reimbursement from the general fund for unnegotiated checks	-67	
Net benefit payments		448,080
Transfer to the Railroad Retirement "Social Security Equivalent Benefit Account"		3,647
Payment for costs of vocational rehabilitation services for disabled beneficiaries		67
Administrative expenses:		
Costs incurred by:		
Social Security Administration	3,859	
Department of the Treasury	267	
Offsetting receipts from sales of supplies, materials, etc.	-1	
Miscellaneous reimbursements from the general fund[3]	-9	
Net administrative expenses		4,116
Total disbursements		455,910
Net increase in assets		159,067
Total assets, September 30, 2002		1,328,808

[1] Includes (1) interest on transfers between the trust fund and the general fund account for the Supplemental Security Income program due to adjustments in the allocation of administrative expenses, (2) interest arising from the revised allocation of administrative expenses among the trust funds, (3) interest earned on the investments of the trust fund, and (4) interest on reimbursements to the trust fund for costs associated with union activities and pension reform.
[2] Less than $500,000.
[3] Reimbursements for costs incurred in performing certain legislatively mandated activities not directly related to administering the OASI and DI programs.

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

Estimates of the operations and status of the OASI, DI and the combined OASI and DI Trust Funds during fiscal years (12 months ending on September 30) 1998-2012 are presented in tables VI.C4, VI.C5 and VI.C6, respectively.

Table VI.C4.—Operations of the OASI Trust Fund in Fiscal Years 1998-2012
[Amounts in billions]

	Income				Cost				Assets		
Fiscal year	Total[1]	Net contributions	Taxation of benefits	Net interest	Total	Benefit payments	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust fund ratio[2]
Historical data:											
1998 . . .	$415.7	$364.9	$8.6	$42.2	$330.0	$324.3	$2.0	$3.7	$85.7	$653.1	172
1999 . . .	447.0	389.9	10.2	46.8	337.9	332.4	1.8	3.7	109.1	762.2	193
2000 . . .	484.2	418.2	12.5	53.5	353.4	347.9	2.0	3.5	130.8	893.0	216
2001 . . .	513.8	440.8	11.8	61.2	373.0	367.7	2.1	3.3	140.8	1,033.8	239
2002 . . .	529.3	448.1	12.6	68.1	389.5	383.9	2.1	3.5	139.7	1,173.6	265
Intermediate:											
2003 . . .	547.2	460.2	12.9	74.1	402.3	396.2	2.4	3.7	145.0	1,318.5	292
2004 . . .	573.4	479.2	12.4	81.8	414.8	408.7	2.5	3.7	158.6	1,477.1	318
2005 . . .	616.3	511.3	13.3	91.7	431.8	425.6	2.5	3.7	184.5	1,661.6	342
2006 . . .	654.4	536.5	14.2	103.7	451.0	445.0	2.5	3.5	203.4	1,864.9	368
2007 . . .	699.1	566.7	15.5	117.0	474.1	468.0	2.5	3.7	225.0	2,090.0	393
2008 . . .	744.0	595.4	17.0	131.6	500.8	494.6	2.5	3.7	243.2	2,333.2	417
2009 . . .	789.7	624.5	18.6	146.6	530.1	523.9	2.5	3.7	259.7	2,592.8	440
2010 . . .	841.9	659.1	20.3	162.5	563.1	556.8	2.5	3.7	278.9	2,871.7	460
2011 . . .	895.7	693.2	23.4	179.2	599.5	593.4	2.6	3.6	296.2	3,167.9	479
2012 . . .	946.6	723.9	26.0	196.7	639.9	633.4	2.6	3.9	306.8	3,474.7	495
Low Cost:											
2003 . . .	548.5	461.3	12.9	74.3	402.1	396.1	2.4	3.7	146.4	1,319.9	292
2004 . . .	581.2	486.3	12.3	82.5	414.1	408.0	2.5	3.6	167.0	1,486.9	319
2005 . . .	622.6	517.0	13.2	92.3	429.0	422.8	2.5	3.7	193.6	1,680.5	347
2006 . . .	658.2	541.0	14.0	103.2	444.9	438.9	2.4	3.5	213.3	1,893.9	378
2007 . . .	699.8	569.6	15.1	115.0	463.2	457.2	2.4	3.6	236.5	2,130.4	409
2008 . . .	741.4	597.0	16.4	128.0	483.6	477.6	2.4	3.6	257.8	2,388.2	441
2009 . . .	785.2	625.0	17.7	142.5	506.7	500.7	2.4	3.5	278.5	2,666.7	471
2010 . . .	834.9	658.0	19.2	157.7	532.9	527.0	2.5	3.5	302.0	2,968.7	500
2011 . . .	886.6	690.1	21.9	174.5	562.0	556.2	2.5	3.3	324.6	3,293.4	528
2012 . . .	935.3	718.7	24.2	192.4	594.3	588.2	2.5	3.6	341.0	3,634.4	554
High Cost:											
2003 . . .	544.5	457.6	12.9	74.0	402.4	396.3	2.4	3.7	142.2	1,315.7	292
2004 . . .	558.5	466.0	12.4	80.1	416.6	410.5	2.5	3.7	141.9	1,457.6	316
2005 . . .	613.4	508.0	13.5	91.9	436.5	430.3	2.5	3.7	176.9	1,634.5	334
2006 . . .	659.2	535.4	14.6	109.1	464.0	457.9	2.5	3.6	195.1	1,829.6	352
2007 . . .	703.4	561.7	16.4	125.3	501.4	495.0	2.5	3.8	202.0	2,031.6	365
2008 . . .	773.5	608.2	18.5	146.9	542.8	536.2	2.6	4.0	230.8	2,262.4	374
2009 . . .	832.0	645.3	20.5	166.2	585.4	578.6	2.7	4.1	246.7	2,509.0	387
2010 . . .	887.9	684.0	22.7	181.2	628.8	621.8	2.7	4.3	259.1	2,768.2	399
2011 . . .	945.1	722.4	26.4	196.4	674.9	667.9	2.7	4.3	270.2	3,038.3	410
2012 . . .	998.6	757.1	29.6	211.9	726.0	718.6	2.8	4.6	272.6	3,311.0	419

[1] "Total Income" column includes transfers made between the OASI Trust Fund and the General Fund of the Treasury that are not included in the separate components of income shown. These transfers consist of payments for (1) the cost of noncontributory wage credits for military service before 1957, and (2) the cost of benefits to certain uninsured persons who attained age 72 before 1968. In February 2002, $414 million was transferred from the General Fund of the Treasury to the OASI Trust Fund for the cost of pre-1957 military service wage credits. Otherwise, these transfers are estimated to be less than $500,000 in each year of the projection period.

[2] The "Trust fund ratio" column represents assets at the beginning of a year (which are identical to assets at the end of the prior year shown in the "Amount at end of year" column) as a percentage of cost for the year. See text beginning on page 36 concerning interpretation of these ratios.

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

Table VI.C5.—Operations of the DI Trust Fund in Fiscal Years 1998-2012
[Amounts in billions]

	Income				Cost				Assets		
Fiscal year	Total[1]	Net contributions	Taxation of benefits	Net interest	Total	Benefit payments	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust fund ratio[2]
Historical data:											
1998. . .	$62.9	$58.0	$0.5	$4.4	$49.3	$47.6	$1.6	$0.2	$13.6	$77.1	129
1999. . .	67.8	61.9	.6	5.2	52.1	50.5	1.5	.1	15.7	92.7	148
2000. . .	77.0	70.0	.8	6.3	56.0	54.2	1.6	.2	21.0	113.8	166
2001. . .	82.1	74.6	.7	7.6	59.9	58.2	1.8	[3]	22.1	135.9	190
2002. . .	85.7	76.1	.9	8.7	66.4	64.2	2.0	.2	19.4	155.3	205
Intermediate:											
2003. . .	88.7	78.1	1.0	9.6	71.7	69.7	1.8	.2	17.0	172.2	217
2004. . .	92.8	81.4	1.0	10.5	78.5	76.2	2.0	.2	14.4	186.6	219
2005. . .	99.3	86.8	1.1	11.4	84.7	82.4	2.1	.3	14.6	201.1	220
2006. . .	104.6	91.1	1.2	12.3	90.0	87.6	2.2	.3	14.6	215.7	223
2007. . .	110.8	96.2	1.3	13.3	95.9	93.3	2.3	.3	14.9	230.6	225
2008. . .	116.8	101.1	1.5	14.3	102.5	99.8	2.4	.3	14.3	245.0	225
2009. . .	122.8	106.1	1.7	15.1	110.1	107.2	2.6	.3	12.7	257.7	223
2010. . .	129.6	111.9	1.9	15.9	117.7	114.6	2.7	.4	11.9	269.6	219
2011. . .	136.4	117.7	2.2	16.5	125.6	122.4	2.9	.4	10.8	280.5	215
2012. . .	142.6	122.9	2.5	17.1	133.7	130.3	3.0	.4	8.8	289.3	210
Low Cost:											
2003. . .	88.9	78.3	1.0	9.6	70.6	68.6	1.8	.2	18.2	173.5	220
2004. . .	94.2	82.6	.9	10.7	75.7	73.5	2.0	.2	18.5	192.0	229
2005. . .	100.6	87.8	1.0	11.8	80.4	78.1	2.1	.3	20.2	212.2	239
2006. . .	105.9	91.9	1.1	12.9	84.0	81.5	2.2	.3	21.9	234.1	253
2007. . .	112.1	96.7	1.2	14.1	87.7	85.1	2.3	.3	24.4	258.5	267
2008. . .	118.2	101.4	1.3	15.5	91.9	89.2	2.4	.3	26.3	284.7	281
2009. . .	124.5	106.1	1.4	16.9	96.7	93.8	2.5	.3	27.9	312.6	295
2010. . .	131.8	111.7	1.6	18.5	101.2	98.2	2.6	.3	30.6	343.2	309
2011. . .	139.2	117.2	1.8	20.1	105.9	102.8	2.8	.3	33.3	376.4	324
2012. . .	146.1	122.0	2.1	22.0	110.7	107.4	2.9	.3	35.4	411.8	340
High Cost:											
2003. . .	88.2	77.7	1.0	9.6	73.7	71.6	1.8	.2	14.6	169.8	211
2004. . .	90.2	79.1	1.0	10.1	83.2	81.0	2.0	.2	7.0	176.8	204
2005. . .	98.2	86.3	1.2	10.7	92.1	89.7	2.1	.3	6.1	182.9	192
2006. . .	103.7	90.9	1.3	11.4	100.7	98.2	2.2	.3	3.0	185.9	182
2007. . .	108.6	95.4	1.5	11.8	111.2	108.5	2.4	.3	-2.5	183.4	167
2008. . .	116.9	103.3	1.8	11.8	122.7	119.8	2.6	.4	-5.8	177.5	149
2009. . .	123.0	109.6	2.0	11.4	134.7	131.6	2.7	.4	-11.7	165.9	132
2010. . .	129.1	116.2	2.3	10.7	145.9	142.6	2.9	.4	-16.8	149.1	114
2011. . .	135.0	122.7	2.8	9.6	157.4	153.8	3.1	.4	-22.4	126.7	95
2012. . .	139.9	128.6	3.2	8.1	169.2	165.4	3.3	.5	-29.3	97.4	75

[1] "Total Income" column includes transfers made between the DI Trust Fund and the General Fund of the Treasury that are not included in the separate components of income shown. These transfers consist of payments for the cost of noncontributory wage credits for military service before 1957. In particular, a transfer was made in December 2000 in the amount of $836 million from the DI Trust Fund to the General Fund of the Treasury. Such transfers are estimated to be less than $500,000 in each year of the projection period.
[2] The "Trust fund ratio" column represents assets at the beginning of a year (which are identical to assets at the end of the prior year shown in the "Amount at end of year" column) as a percentage of cost for the year. See text beginning on page 36 concerning interpretation of these ratios.
[3] Less than $50 million.

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

Table VI.C6.—Operations of the Combined OASI and DI Trust Funds in Fiscal Years 1998-2012

[Amounts in billions]

	Income				Cost				Assets		
Fiscal year	Total[1]	Net contributions	Taxation of benefits	Net interest	Total	Benefit payments	Administrative costs	RRB interchange	Net increase during year	Amount at end of year	Trust fund ratio[2]
Historical data:											
1998. . .	$478.6	$422.9	$9.1	$46.6	$379.3	$371.9	$3.6	$3.8	$99.3	$730.2	166
1999. . .	514.7	451.9	10.8	52.1	390.0	382.8	3.4	3.8	124.7	854.9	187
2000. . .	561.3	488.2	13.2	59.8	409.4	402.1	3.6	3.7	151.8	1,006.8	209
2001. . .	595.9	515.4	12.5	68.8	432.9	425.8	3.8	3.3	163.0	1,169.7	233
2002. . .	615.0	524.2	13.5	76.8	455.9	448.1	4.1	3.6	159.1	1,328.8	257
Intermediate:											
2003. . .	635.9	538.3	13.9	83.7	474.0	465.9	4.2	3.9	161.9	1,490.7	280
2004. . .	666.3	560.6	13.3	92.3	493.3	484.9	4.5	3.9	172.9	1,663.7	302
2005. . .	715.6	598.1	14.4	103.0	516.5	508.0	4.6	3.9	199.1	1,862.7	322
2006. . .	759.0	627.6	15.4	116.0	541.1	532.6	4.6	3.8	217.9	2,080.6	344
2007. . .	809.9	662.9	16.8	130.2	570.0	561.2	4.8	4.0	240.0	2,320.6	365
2008. . .	860.9	696.5	18.5	145.9	603.3	594.4	4.9	4.0	257.6	2,578.2	385
2009. . .	912.5	730.6	20.2	161.7	640.2	631.1	5.1	4.0	272.4	2,850.6	403
2010. . .	971.6	771.0	22.2	178.4	680.8	671.5	5.2	4.1	290.8	3,141.3	419
2011. . .	1,032.2	810.9	25.6	195.7	725.2	715.7	5.4	4.0	307.0	3,448.3	433
2012. . .	1,089.2	846.8	28.6	213.8	773.6	763.7	5.6	4.3	315.6	3,763.9	446
Low Cost:											
2003. . .	637.3	539.6	13.9	83.9	472.8	464.7	4.2	3.9	164.6	1,493.4	281
2004. . .	675.4	568.8	13.3	93.2	489.9	481.5	4.5	3.9	185.5	1,678.9	305
2005. . .	723.2	604.8	14.3	104.1	509.4	500.9	4.6	3.9	213.8	1,892.7	330
2006. . .	764.1	632.9	15.1	116.1	528.8	520.5	4.6	3.7	235.3	2,128.0	358
2007. . .	811.8	666.3	16.3	129.2	550.9	542.3	4.7	3.9	260.9	2,388.9	386
2008. . .	859.6	698.4	17.7	143.5	575.5	566.9	4.8	3.9	284.1	2,673.0	415
2009. . .	909.7	731.1	19.2	159.4	603.3	594.5	5.0	3.8	306.3	2,979.3	443
2010. . .	966.7	769.7	20.8	176.2	634.1	625.2	5.1	3.8	332.6	3,311.9	470
2011. . .	1,025.8	807.3	23.8	194.7	667.9	659.0	5.3	3.7	357.9	3,669.8	496
2012. . .	1,081.4	840.8	26.3	214.4	704.9	695.6	5.4	3.9	376.4	4,046.2	521
High Cost:											
2003. . .	632.8	535.3	13.9	83.5	476.0	467.9	4.2	3.9	156.7	1,485.5	279
2004. . .	648.8	545.1	13.4	90.2	499.9	491.5	4.5	3.9	148.9	1,634.4	297
2005. . .	711.5	594.2	14.7	102.7	528.6	520.0	4.6	4.0	183.0	1,817.4	309
2006. . .	762.8	626.3	16.0	120.6	564.7	556.2	4.7	3.8	198.1	2,015.5	322
2007. . .	812.0	657.0	17.9	137.1	612.5	603.5	4.9	4.2	199.5	2,215.0	329
2008. . .	890.4	711.4	20.2	158.7	665.5	656.0	5.2	4.3	224.9	2,439.9	333
2009. . .	955.0	754.8	22.5	177.7	720.1	710.2	5.4	4.5	235.0	2,674.9	339
2010. . .	1,017.1	800.2	25.0	191.9	774.7	764.4	5.6	4.7	242.3	2,917.2	345
2011. . .	1,080.1	845.0	29.1	205.9	832.3	821.8	5.8	4.7	247.8	3,165.0	350
2012. . .	1,138.4	885.7	32.7	220.0	895.1	884.0	6.1	5.1	243.3	3,408.4	354

[1] "Total Income" column includes transfers made between the OASI and DI Trust Funds and the General Fund of the Treasury that are not included in the separate components of income shown. These transfers consist of payments for (1) the cost of noncontributory wage credits for military service before 1957, and (2) the cost of benefits to certain uninsured persons who attained age 72 before 1968. In particular, a transfer was made in December 2000 in the amount of $836 million from the DI Trust Fund to the General Fund of the Treasury. In February 2002, $414 million was transferred from the General Fund of the Treasury to the OASI Trust Fund for the cost of pre-1957 military service wage credits. Otherwise, these transfers are estimated to be less than $500,000 in each year of the projection period.

[2] The "Trust fund ratio" column represents assets at the beginning of a year (which are identical to assets at the end of the prior year shown in the "Amount at end of year" column) as a percentage of cost for the year. See text beginning on page 36 concerning interpretation of these ratios.

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

D. LONG-RANGE SENSITIVITY ANALYSIS

This appendix presents estimates which illustrate the sensitivity of the long-range actuarial status of the OASDI program to changes in selected individual assumptions. The estimates based on the three alternative sets of assumptions (see sections IV.B, V.A, and V.B) illustrate the effects of varying all of the principal assumptions simultaneously in order to portray a generally more optimistic or pessimistic future, in terms of the financial status of the OASDI program. In the sensitivity analysis presented in this appendix, the intermediate alternative II projection is used as the reference point, and one assumption at a time is varied within that alternative. The variation used for each individual assumption reflects the levels used for that assumption in the low cost alternative I and high cost alternative III projections. Similar variations in the selected assumptions within the other alternatives would result in similar relative variations in the long-range estimates.

Each table that follows shows the effects of changing a particular assumption on the OASDI summarized income rates, summarized cost rates, and actuarial balances for 25-year, 50-year, and 75-year valuation periods. Because the annual payroll tax rate is constant for the entire 75-year valuation period, the income rate varies only slightly with changes in assumptions and, therefore, is not considered in the discussion of the tables. The change in each of the actuarial balances is approximately equal to the change in the corresponding cost rate, but in the opposite direction.

1. Total Fertility Rate

Table VI.D1 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II with various assumptions about the ultimate total fertility rate. These assumptions are that the ultimate total fertility rate will be 1.7, 1.95, and 2.2 children per woman as assumed for alternatives III, II, and I, respectively. The rate is assumed to change gradually from its current level and to reach the various ultimate values in 2027.

Table VI.D1.—Sensitivity to Varying Fertility Assumptions
[As a percentage of taxable payroll]

Valuation period	Ultimate total fertility rate[1,2]		
	1.7	1.95	2.2
Summarized income rate:			
25-year: 2003-27	14.34	14.34	14.34
50-year: 2003-52	13.90	13.89	13.89
75-year: 2003-77	13.81	13.78	13.75
Summarized cost rate:			
25-year: 2003-27	13.06	13.09	13.11
50-year: 2003-52	14.90	14.84	14.78
75-year: 2003-77	16.00	15.70	15.40
Actuarial balance:			
25-year: 2003-27	+1.28	+1.26	+1.23
50-year: 2003-52	-1.00	-.95	-.90
75-year: 2003-77	-2.19	-1.92	-1.65
Year of combined trust fund exhaustion	2042	2042	2042

[1] 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 were to experience the birth rates by age observed in, or assumed for, the selected year, and if she were to survive the entire childbearing period. The ultimate total fertility rate is assumed to be reached in 2027.

[2] Ultimate total fertility rates used for this analysis are 1.7 from the alternative III assumptions, 1.95 from the alternative II assumptions, and 2.2 from the alternative I assumptions. All other assumptions used for this analysis are from alternative II.

For the 25-year period, the cost rate for the three fertility assumptions varies by only about 0.05 percent of taxable payroll. In contrast, the 75-year cost rate varies over a wide range, decreasing from 16.00 to 15.40 percent, as the assumed ultimate total fertility rate increases from 1.7 to 2.2. Similarly, while the 25-year actuarial balance varies by only 0.05 percent of taxable payroll, the 75-year actuarial balance varies over a much wider range, from -2.19 to -1.65 percent.

During the 25-year period, the very slight increases in the working population resulting from increases in fertility are more than offset by decreases in the female labor force and increases in the number of child beneficiaries. Hence, the program cost slightly increases with higher fertility. For the 75-year long-range period, however, changes in fertility have a relatively greater impact on the labor force than on the beneficiary population. As a result, an increase in fertility significantly reduces the cost rate. Each increase of 0.1 in the ultimate total fertility rate increases the long-range actuarial balance by about 0.11 percent of taxable payroll.

2. Death Rates

Table VI.D2 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II with various assumptions about future reductions in death rates for the period 2002-77. These assumptions

are the same as those used for alternatives I, II, and III, which are described in section V.A.2. The age-sex-adjusted death rates decline at average annual rates of 0.35 percent, 0.76 percent, and 1.33 percent for alternatives I, II, and III, respectively. It should be noted that these reductions do not apply uniformly to all ages, as some variation by age was assumed consistent with the objective of selecting assumptions for alternatives I and III that are relatively more optimistic and more pessimistic, respectively, in terms of the financing of the OASDI program.

Table VI.D2.—Sensitivity to Varying Death-Rate Assumptions
[As a percentage of taxable payroll]

Valuation period	Average annual death-rate reduction[1, 2]		
	0.35 percent	0.76 percent	1.33 percent
Summarized income rate:			
25-year: 2003-27	14.34	14.34	14.35
50-year: 2003-52	13.87	13.89	13.91
75-year: 2003-77	13.75	13.78	13.82
Summarized cost rate:			
25-year: 2003-27	12.92	13.09	13.26
50-year: 2003-52	14.39	14.84	15.36
75-year: 2003-77	15.01	15.70	16.51
Actuarial balance:			
25-year: 2003-27	+1.41	+1.26	+1.09
50-year: 2003-52	-.51	-.95	-1.44
75-year: 2003-77	-1.26	-1.92	-2.69
Year of combined trust fund exhaustion	2047	2042	2039

[1]The average annual death-rate reduction is the average annual decline in the age-sex-adjusted death rate during 2002-77. The overall decreases from the age-sex-adjusted death rate in 2002 to the corresponding rate in 2077 are, in order, 21 percent, 43 percent, and 63 percent.
[2] The average annual death-rate reductions used for this analysis are 0.35 percent from the alternative I assumptions, 0.76 percent from the alternative II assumptions, and 1.33 percent from the alternative III assumptions. All other assumptions used for this analysis are from alternative II.

The variation in cost for the 25-year period is less pronounced than the variation for the 75-year period because the decreases in death rates are assumed to occur gradually. The 25-year cost rate increases from 12.92 percent (for an average annual death-rate reduction of 0.35 percent) to 13.26 percent (for an average annual death-rate reduction of 1.33 percent). The 75-year cost rate increases from 15.01 to 16.51 percent. The actuarial balance decreases from +1.41 to +1.09 percent for the 25-year period, and from -1.26 to -2.69 percent for the 75-year period.

Lower death rates cause both the income (as well as taxable payroll) and the cost of the OASDI program to be higher than they would otherwise be. The relative increase in cost, however, exceeds the relative increase in taxable payroll. For any given year, reductions in the death rates for people who are age 62 and over (people whose death rates are the highest) increase the num-

ber of retired-worker beneficiaries (and, therefore, the amount of retirement benefits paid) without adding significantly to the number of covered workers (and, therefore, to the taxable payroll). Although reductions for people aged 50 to retirement eligibility age do result in significant increases to the taxable payroll, those increases are not large enough to offset the sum of the additional retirement benefits mentioned above and the disability benefits paid to additional beneficiaries at these pre-retirement ages, which are ages of high disability incidence. At ages under 50, death rates are so low that even substantial reductions would not result in significant increases in the numbers of covered workers or beneficiaries. Consequently, if death rates for all ages are lowered by about the same relative amount, cost increases at a rate greater than the rate of growth in payroll, thereby resulting in higher cost rates and, therefore, lower actuarial balances. Each additional 0.1-percentage-point reduction in the average annual death-rate reduction, relative to the 0.76-percent reduction assumed for alternative II, decreases the long-range actuarial balance by about 0.14 percent of taxable payroll.

3. Net Immigration

Table VI.D3 shows the estimated OASDI income rates, cost rates, and actuarial balances, under alternative II with various assumptions about the magnitude of net immigration. These assumptions are that the annual net immigration will be 672,500 persons, 900,000 persons, and 1,300,000 persons as assumed for alternatives III, II, and I, respectively.

Table VI.D3.—Sensitivity to Varying Net-Immigration Assumptions
[As a percentage of taxable payroll]

Valuation period	Net immigration per year[1, 2]		
	672,500	900,000	1,300,000
Summarized income rate:			
25-year: 2003-27	14.36	14.34	14.31
50-year: 2003-52	13.92	13.89	13.86
75-year: 2003-77	13.81	13.78	13.74
Summarized cost rate:			
25-year: 2003-27	13.20	13.09	12.95
50-year: 2003-52	15.04	14.84	14.58
75-year: 2003-77	15.92	15.70	15.40
Actuarial balance:			
25-year: 2003-27	+1.17	+1.26	+1.37
50-year: 2003-52	-1.12	-.95	-.72
75-year: 2003-77	-2.12	-1.92	-1.66
Year of combined trust fund exhaustion	2041	2042	2045

[1] Net immigration per year is the assumed annual net immigration to the Social Security area, including both legal and other-than-legal immigration.
[2] The net immigration per year assumptions used for this analysis are 672,500 from the alternative III assumptions, 900,000 from the alternative II assumptions, and 1,300,000 from the alternative I assumptions. All other assumptions used for this analysis are from alternative II.

For all three periods, the cost rate decreases with increasing rates of net immigration. For the 25-year period, the cost rate decreases from 13.20 percent of taxable payroll (for annual net immigration of 672,500 persons) to 12.95 percent (for annual net immigration of 1,300,000 persons). For the 50-year period, it decreases from 15.04 percent to 14.58 percent, and for the 75-year period, it decreases from 15.92 percent to 15.40 percent. The actuarial balance increases from +1.17 to +1.37 percent for the 25-year period, from -1.12 to -0.72 for the 50-year period, and from -2.12 to -1.66 percent for the 75-year period.

The cost rate decreases with increasing rates of net immigration because immigration occurs at relatively young ages, thereby increasing the numbers of covered workers earlier than the numbers of beneficiaries. Each additional group of 100,000 immigrants relative to the 900,000 net immigration assumed for alternative II, increases the long-range actuarial balance by about 0.07 percent of taxable payroll.

4. Real-Wage Differential

Table VI.D4 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II with various assumptions about the real-wage differential. These assumptions are that the ultimate real-wage differential will be 0.6 percentage point, 1.1 percentage points, and 1.6 percentage points as assumed for alternatives III, II, and I, respectively. In each case, the ultimate annual increase in the CPI is assumed to be 3.0 percent (as assumed for alternative II), yielding ultimate percentage increases in average annual wages in covered employment of 3.6, 4.1, and 4.6 percent.

For the 25-year period, the cost rate decreases from 13.49 percent (for a real-wage differential of 0.6 percentage point) to 12.69 percent (for a differential of 1.6 percentage points). For the 50-year period, it decreases from 15.43 to 14.25 percent, and for the 75-year period it decreases from 16.32 to 15.06 percent. The actuarial balance increases from +0.94 to +1.57 percent for the 25-year period, from -1.43 to -0.46 for the 50-year period, and from -2.42 to -1.40 percent for the 75-year period.

Table VI.D4.—Sensitivity to Varying Real-Wage Assumptions
[As a percentage of taxable payroll]

Valuation period	Ultimate percentage increase in wages-CPI[1, 2]		
	3.6-3.0	4.1-3.0	4.6-3.0
Summarized income rate:			
25-year: 2003-27	14.43	14.34	14.26
50-year: 2003-52	14.00	13.89	13.79
75-year: 2003-77	13.90	13.78	13.66
Summarized cost rate:			
25-year: 2003-27	13.49	13.09	12.69
50-year: 2003-52	15.43	14.84	14.25
75-year: 2003-77	16.32	15.70	15.06
Actuarial balance:			
25-year: 2003-27	+.94	+1.26	+1.57
50-year: 2003-52	-1.43	-.95	-.46
75-year: 2003-77	-2.42	-1.92	-1.40
Year of combined trust fund exhaustion	2038	2042	2049

[1] The first value in each pair is the assumed ultimate annual percentage increase in average wages in covered employment. The second value is the assumed ultimate annual percentage increase in the Consumer Price Index. The difference between the two values is the ultimate real-wage differential.
[2] The ultimate real-wage differentials of 0.6, 1.1, and 1.6 percentage points are the same as in alternatives III, II, and I, respectively. All other assumptions used for this analysis are from alternative II.

The cost rate decreases with increasing real-wage differentials, because, higher wages affect the taxable payroll immediately but increase benefit levels only gradually as new beneficiaries become entitled. In addition, cost-of-living adjustments (COLAs) to benefits are not affected by changes in wages, but only in prices. Each 0.5-percentage-point increase in the assumed real-wage differential increases the long-range actuarial balance by about 0.51 percent of taxable payroll.

5. Consumer Price Index

Table VI.D5 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II with various assumptions about the rate of increase for the Consumer Price Index (CPI). These assumptions are that the ultimate annual increase in the CPI will be 2.0 percent, 3.0 percent, and 4.0 percent as assumed for alternatives I, II, and III, respectively. In each case, the ultimate real-wage differential is assumed to be 1.1 percentage points (as assumed for alternative II), yielding ultimate percentage increases in average annual wages in covered employment of 3.1, 4.1, and 5.1 percent.

Table VI.D5.—Sensitivity to Varying CPI-Increase Assumptions
[As a percentage of taxable payroll]

Valuation period	Ultimate percentage increase in wages-CPI[1, 2]		
	3.1-2.0	4.1-3.0	5.1-4.0
Summarized income rate:			
25-year: 2003-27	14.38	14.34	14.31
50-year: 2003-52	13.92	13.89	13.87
75-year: 2003-77	13.80	13.78	13.75
Summarized cost rate:			
25-year: 2003-27	13.24	13.09	12.94
50-year: 2003-52	15.06	14.84	14.62
75-year: 2003-77	15.94	15.70	15.45
Actuarial balance:			
25-year: 2003-27	+1.14	+1.26	+1.37
50-year: 2003-52	-1.14	-.95	-.76
75-year: 2003-77	-2.14	-1.92	-1.70
Year of combined trust fund exhaustion	2040	2042	2044

[1] The first value in each pair is the assumed ultimate annual percentage increase in average wages in covered employment. The second value is the assumed ultimate annual percentage increase in the Consumer Price Index. The difference between the two values is the ultimate real-wage differential.
[2] The ultimate CPI increases of 2.0, 3.0, and 4.0 percent are the same as in alternatives I, II, and III, respectively. The ultimate real-wage differential of 1.1 percentage points is the same as in alternative II. All other assumptions used for this analysis are also from alternative II.

For all three periods, the cost rate decreases with greater assumed rates of increase in the CPI. For the 25-year period, the cost rate decreases from 13.24 (for CPI increases of 2.0 percent) to 12.94 percent (for CPI increases of 4.0 percent). For the 50-year period, it decreases from 15.06 to 14.62 percent, and for the 75-year period, it decreases from 15.94 to 15.45 percent. The actuarial balance increases from +1.14 to +1.37 percent for the 25-year period, from -1.14 to -0.76 for the 50-year period, and from -2.14 to -1.70 percent for the 75-year period.

The patterns described above result primarily from the time lag between the effects of the CPI changes on taxable payroll and on benefit payments. When assuming a greater rate of increase in the CPI (in combination with a constant real-wage differential), the effect on taxable payroll due to a greater rate of increase in average wages is experienced immediately, while the effect on benefits due to a larger COLA is experienced with a lag of about 1 year. Thus, the higher taxable payrolls have a stronger effect than the higher benefits, thereby resulting in lower cost rates. The effect of each 1.0-percentage-point increase in the rate of change assumed for the CPI is an increase in the long-range actuarial balance of about 0.22 percent of taxable payroll.

6. Real Interest Rate

Table VI.D6 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II with various assumptions about

the annual real interest rate for special public-debt obligations issuable to the trust funds, which are compounded semiannually. These assumptions are that the ultimate annual real interest rate will be 2.2 percent, 3.0 percent, and 3.7 percent as assumed for alternatives III, II, and I, respectively. In each case, the ultimate annual increase in the CPI is assumed to be 3.0 percent (as assumed for alternative II), resulting in ultimate annual yields of 5.3, 6.1, and 6.8 percent.

Table VI.D6.—Sensitivity to Varying Real-Interest Assumptions
[As a percentage of taxable payroll]

Valuation period	Ultimate annual real interest rate[1, 2]		
	2.2 percent	3.0 percent	3.7 percent
Summarized income rate:			
25-year: 2003-27	14.26	14.34	14.41
50-year: 2003-52	13.80	13.89	13.98
75-year: 2003-77	13.68	13.78	13.87
Summarized cost rate:			
25-year: 2003-27	13.23	13.09	12.96
50-year: 2003-52	15.19	14.84	14.54
75-year: 2003-77	16.22	15.70	15.26
Actuarial balance:			
25-year: 2003-27	+1.03	+1.26	+1.45
50-year: 2003-52	-1.39	-.95	-.56
75-year: 2003-77	-2.54	-1.92	-1.38
Year of combined trust fund exhaustion	2039	2042	2046

[1] The ultimate real interest rate is defined to be the effective annual yield on assets held by the trust funds divided by the annual rate of growth in the CPI.
[2] The ultimate annual real interest rates used for this analysis are 2.2 percent from the alternative III assumptions, 3.0 percent from the alternative II assumptions, and 3.7 percent from the alternative I assumptions. All other assumptions used for this analysis are from alternative II.

For the 25-year period, the cost rate decreases slightly with increasing real interest rates from 13.23 percent (for an ultimate real interest rate of 2.2 percent) to 12.96 percent (for an ultimate real interest rate of 3.7 percent). For the 50-year period, it decreases from 15.19 to 14.54 percent, and for the 75-year period, it decreases from 16.22 to 15.26 percent. The actuarial balance increases from +1.03 to +1.45 percent for the 25-year period, from -1.39 to -0.56 percent for the 50-year period, and from -2.54 to -1.38 percent for the 75-year period. Each 0.5-percentage-point increase in the assumed real interest rate increases the long-range actuarial balance by about 0.39 percent of taxable payroll.

7. Disability Incidence Rates

Table VI.D7 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II with various assumptions concerning future disability incidence rates. For all three alternatives, incidence

rates by age and sex are assumed to vary during the early years of the projection period before attaining ultimate levels in 2027. The ultimate levels attained vary by sex. In comparison to the corresponding annual rates experienced during the base period 1994-96, the ultimate rates for men are about 14 percent lower for alternative I, about 8 percent higher for alternative II, and about 29 percent higher for alternative III. For women they are about 19 percent lower for alternative I, 2 percent higher for alternative II, and 22 percent higher for alternative III.

Table VI.D7.—Sensitivity to Varying Disability Incidence Assumptions
[As a percentage of taxable payroll]

Valuation period	Disability incidence rates based on alternative— I	II	III
Summarized income rate:			
25-year: 2003-27	14.34	14.34	14.34
50-year: 2003-52	13.89	13.89	13.90
75-year: 2003-77	13.77	13.78	13.78
Summarized cost rate:			
25-year: 2003-27	12.97	13.09	13.21
50-year: 2003-52	14.62	14.84	15.06
75-year: 2003-77	15.45	15.70	15.94
Actuarial balance:			
25-year: 2003-27	+1.37	+1.26	+1.13
50-year: 2003-52	-.74	-.95	-1.16
75-year: 2003-77	-1.68	-1.92	-2.16
Year of combined trust fund exhaustion	2045	2042	2040

For the 25-year period, the cost rate increases with increasing disability incidence rates from 12.97 percent (for the relatively low rates assumed for alternative I) to 13.21 percent (for the relatively high rates assumed for alternative III). For the 50-year period, it increases from 14.62 to 15.06 percent, and for the 75-year period, it increases from 15.45 to 15.94 percent. The actuarial balance decreases from +1.37 to +1.13 percent for the 25-year period, from -0.74 to -1.16 percent for the 50-year period, and from -1.68 to -2.16 percent for the 75-year period.

8. Disability Termination Rates

Table VI.D8 shows the estimated OASDI income rates, cost rates, and actuarial balances, on the basis of alternative II with various assumptions about future disability termination rates. For alternative II, death-termination rates by age and sex are assumed to decline until they reach levels by the end of the 75-year period that, for men and women, respectively, are about 57 percent and 48 percent lower than those experienced during the base period

1991-95. For the other alternatives, the rates are assumed to spread gradually from the rates for alternative II. By the end of the projection period, for alternatives I and III, respectively, the rates for men are about 41 percent and 74 percent lower than those experienced during the base period; for women the corresponding rates are about 30 percent and 69 percent lower than those experienced during the base period.

For all three alternatives, ultimate recovery-termination rates by age and sex are assumed to be attained in 2022. For alternative II, such rates are assumed to be 87 percent higher for men and 58 percent higher for women than those experienced in the base period, 1991-95. The ultimate rates for alternative I are assumed to be 125 percent higher for men and 89 percent higher for women than those experienced in the base period. The ultimate rates for alternative III are assumed to be 50 percent higher for men and 26 percent higher for women than those experienced in the base period.

Table VI.D8.—Sensitivity to Varying Disability Termination Assumptions
[As a percentage of taxable payroll]

Valuation period	Disability termination rates based on alternative— I	II	III
Summarized income rate:			
25-year: 2003-27	14.34	14.34	14.34
50-year: 2003-52	13.89	13.89	13.89
75-year: 2003-77	13.78	13.78	13.78
Summarized cost rate:			
25-year: 2003-27	13.06	13.09	13.11
50-year: 2003-52	14.81	14.84	14.87
75-year: 2003-77	15.67	15.70	15.72
Actuarial balance:			
25-year: 2003-27	+1.28	+1.26	+1.23
50-year: 2003-52	-.92	-.95	-.98
75-year: 2003-77	-1.89	-1.92	-1.95
Year of combined trust fund exhaustion	2043	2042	2042

For the 25-year period, the cost rate increases with decreasing disability termination rates from 13.06 percent (for the relatively high rates assumed for alternative I) to 13.11 percent (for the relatively low rates assumed for alternative III). For the 50-year period, it increases from 14.81 to 14.87 percent, and for the 75-year period, it increases from 15.67 to 15.72 percent. The actuarial balance decreases from +1.28 to +1.23 percent for the 25-year period, from -0.92 to -0.98 percent for the 50-year period, and from -1.89 to -1.95 percent for the 75-year period.

E. STOCHASTIC PROJECTIONS

Significant uncertainty surrounds the estimates under the intermediate assumptions, especially for a period as long as 75 years. This appendix presents a way to illustrate the uncertainty of these estimates. It is intended to supplement the traditional methods of examining such uncertainty and to illustrate the potential value of new techniques.

Due to time constraints, results presented reflect the intermediate assumptions and the methods of the 2002 Trustees Report. Updating to the assumptions and methods of the 2003 Trustees Report is not expected to materially change the results.

1. Background

The Trustees Report has traditionally shown additional estimates using a low cost and a high cost set of specified assumptions to reflect the presence of uncertainty. These additional estimates provide a range of possible outcomes for the projections. However, they provide no indication of the probability that actual future experience will be inside or outside the range of these estimates. For the first time, this Trustees Report presents the results of a new model, based on stochastic modeling techniques, that estimates a probability distribution of future outcomes of the financial status of the combined OASI and DI Trust Funds. It should be noted that this model is in its first stage of development. Future improvements and refinements to the model are expected. In particular, future revisions are expected to reflect a fuller range of uncertainty about the future, as is discussed below.

2. Methodology

Other sections of this report provide estimates of the financial status of the combined OASI and DI Trust Funds using a "deterministic" model. For the deterministic model, certain assumptions are made regarding levels of fertility, changes in mortality, immigration levels, emigration levels, net other-than-legal immigration levels, changes in average real wages, changes in the consumer price index, unemployment rates, trust fund real yield rates, and disability incidence and recovery rates. Each of these variables will reach an assumed ultimate value at a specific point during the long-range period and will maintain that value throughout the remainder of the period. As mentioned above, three deterministic scenarios are developed assuming separate, specified values for each of these variables.

In contrast, the results of five thousand independent stochastic simulations are presented in this appendix. Each of the five thousand simulations is determined by allowing the above variables to vary throughout the long-

range period. The fluctuation in the variable is projected by using standard time-series modeling, a method designed to help make inferences based on historical data. Generally, each variable is modeled by an equation that captures a relationship between current and prior years' values of the variable and introduces year by year random variation, as reflected in the historical period. For some variables, the equations additionally establish relationships with other variables. Parameters for the equations are fitted to historical data for periods ranging from the past 16 years to the past 100 years depending on the nature and quality of data available. More detail on these equations, this model, and stochastic modeling in general is available on the internet at www.ssa.gov/OACT/stochastic/index.html. Each time-series equation is designed such that, in the absence of random variation, the value of the variable would equal the value assumed under the intermediate set of assumptions.

For each simulation of the model, values of the variables listed above are determined by using Monte Carlo techniques to randomly assign the year by year variations. Each simulation produces an estimate of the financial status of the combined OASI and DI Trust Funds. Results shown in this section, based on the five thousand simulations of the model, reflect the distribution of results.

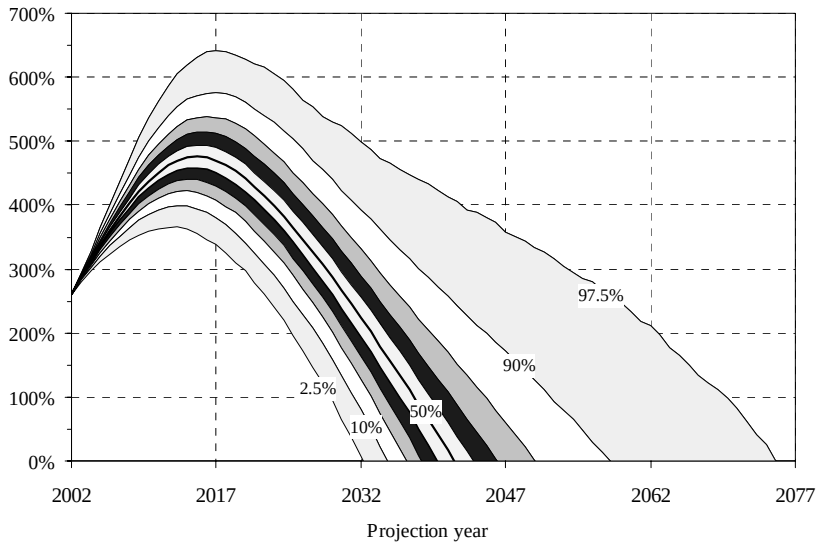
The results from this model should be interpreted with caution and with a full understanding of the inherent limitations. Results could differ significantly if any of several alternative equations were specified for one of the variables, the degree of covariance among variables were modified, or the historical period used in fitting any of the equations to the variable values were changed. For some variables, using the variations exhibited in a relatively recent historical period may not provide a realistic representation of the potential variation for the future. In addition, results would differ if additional variables other than those mentioned above (such as labor force participation rates, retirement rates, marriage rates, and divorce rates) were included in the modeling. Generally, adding additional variables would increase the variability of the results. Furthermore, additional variability could result from incorporating statistical approaches that would more fully model change in the long-range central tendencies of the variables. The historical period available for most variables is relatively homogeneous and does not reflect many substantial shifts. The time-series modeling reflects what occurred in the historical period. As a result, the variation indicated in this appendix should be viewed as the minimum plausible potential variation for the future. Substantial shifts, as predicted by many experts and as seen in prior centuries, are not fully reflected in the current model.

3. Results

The probability distribution of the annual trust fund ratios for the combined OASI and DI Trust Funds is shown in figure VI.E1. The two extreme lines in this figure illustrate the range within which future annual trust fund ratios are estimated to occur 95 percent of the time (i.e., a 95-percent confidence interval). In other words, actual future trust fund ratios in a given year would be expected to exceed the upper bound only 2.5 percent of the time or to fall below the lower bound 2.5 percent of the time. Other lines in the figure display additional confidence intervals (80-percent, 60-percent, 40-percent, and 20-percent) around future annual trust fund ratios. The median estimate for each year indicates the trust fund ratio which is projected by this model to fall exactly in the middle of possible outcomes for that year. It is important to note that these lines do not represent the results of individual stochastic simulations. Instead, for each given year, they represent the percentile distribution of trust fund ratios based on all stochastic simulations for that year.

The median estimate for each year indicates that the assets of the combined OASI and DI Trust Funds would be exhausted by 2041 with a probability of 50 percent. This exhaustion date is the same as the year of exhaustion projected under the intermediate assumptions in the 2002 Trustees Report. Figure VI.E1 also shows that there is a 2.5 percent chance that the trust funds will become exhausted after 2074. In comparison, the assets of the combined OASI and DI Trust Funds are not projected to exhaust during the 75-year period under the low cost assumptions of the 2002 Trustees Report. Figure VI.E1 also shows that there is a 2.5 percent chance of the trust funds becoming exhausted by 2032. This year is 3 years later than 2029, the year of exhaustion projected under the high cost assumptions of the 2002 Trustees Report. Thus, results from the stochastic model show that the 95-percent confidence interval does not include the exhaustion date under the low cost or high cost alternatives.

Figure VI.E1.—Annual Trust Fund Ratios



The probability distribution of the year-by-year OASDI cost rates (i.e., cost as a percentage of taxable payroll) are shown in figure VI.E2. The range of the cost rates widens as the projections move further into the future, reflecting increasing uncertainty. The income rate under the intermediate assumptions is also included in the graph in order to give some indication of the patterns of cash flow for the OASDI program. Only this income rate is included because of the relatively small variation in income rates throughout the projection period. The lines in the figure display the median set (50th percentile) of estimated annual cost rates and the 95-percent, 80-percent, 60-percent, 40-percent, and 20-percent confidence intervals expected for future annual cost rates. It is important to note that these lines do not represent the results of individual stochastic simulations. Instead, for each given year, they represent the percentile distribution of cost rates based on all stochastic simulations for that year.

Figure VI.E2.—Annual Cost Rates

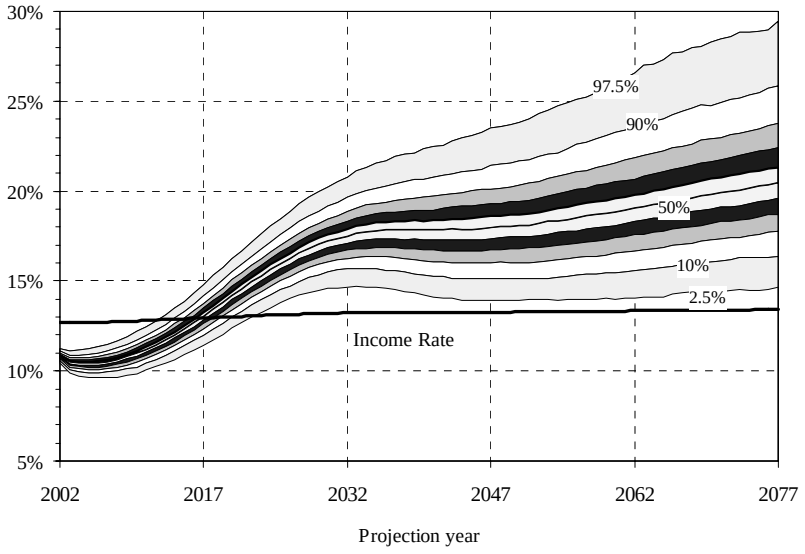


Table VI.E1 displays long-range actuarial estimates for the combined OASDI program resulting from using both the deterministic and stochastic approaches reflecting the assumptions of the 2002 Trustees Report. Actuarial estimates included in the table are for the long-range period, 2002-76. Stochastic estimates are shown for the median (50th percentile) and for the 95-percent and 80-percent confidence intervals. For comparison, deterministic estimates are shown for the intermediate, low cost, and high cost assumptions. Each stochastic estimate displayed in the table does represent the results of one stochastic simulation. However, for a given percentile, the stochastic estimates shown for the different long-range actuarial measures are generally not from the same stochastic simulation.

Median stochastic estimates for the actuarial measures displayed in table VI.E1 are the same or slightly more pessimistic for the combined OASI and DI Trust Funds than those projected under the intermediate assumptions in the 2002 Trustees Report. The median estimate of the long-range actuarial balance is -1.92 percent of taxable payroll, 0.05 percentage points lower than projected under the intermediate assumptions. The median estimate for the first year cost exceeds tax income is 2017 and for the year assets first become exhausted is 2041. These are the same as those projected under the intermediate assumptions. The median estimate for the annual cost in the 75th year of the projection period is 20.33 as a percent of taxable payroll and

7.17 as a percent of GDP. The comparable estimates using the intermediate assumptions are 19.84 and 7.00, respectively.

The 95-percent confidence interval determined by the stochastic modeling projections can be compared to the range of variation defined by the traditional low cost and high cost alternatives. For two of the measures in table VI.E1 (the actuarial balance and the year assets become first exhausted), the 95-percent stochastic projection range is narrower than the range defined by the low cost and high cost alternatives. That is, for these measures, the estimates under the low cost and high cost alternatives fall outside the 95-percent confidence interval determined by the stochastic modeling projections. In contrast, for two other measures in the table (the first year cost exceeds tax income and the annual cost in the 75th year of the projection period expressed as a percent of GDP), the 95-percent stochastic projection range includes the estimates under the low and high cost alternatives. For the remaining measure in the table (the annual cost in the 75th year of the projection period expressed as a percent of taxable payroll), the 95-percent stochastic projection range includes the estimates under the high cost alternative, but does not include the low cost estimates.

Table VI.E1.—Long-Range[1] Estimates Relating to the Actuarial Status of the Combined OASDI Program Reflecting the Assumptions of the 2002 Trustees Report
[Comparison of deterministic results and stochastic results]

	Traditional deterministic model			Stochastic model				
					80-Percent confidence interval		95-Percent confidence interval	
	Intermediate	Low Cost	High Cost	Median 50th percentile	10th percentile	90th percentile	2.5th percentile	97.5th percentile
Actuarial balance	-1.87	0.44	-5.00	-1.92	-3.28	-0.71	-4.07	-0.17
Open group unfunded obligation (in trillions)	$3.3	-$1.1	$9.3	$3.5	$6.3	$1.1	$8.2	2/
First year cost exceeds tax income	2017	2021	2013	2017	2014	2020	2013	2022
Year assets become exhausted	2041	3/	2029	2041	2034	2057	2032	2075
Annual cost in 75th year (percent of taxable payroll)	19.84	14.24	28.51	20.33	16.32	25.72	14.53	29.98
Annual cost in 75th year (percent of GDP)	7.00	5.43	9.28	7.17	5.76	9.08	5.13	10.23

[1] 75-year period: 2002-2076.
[2] Less than $50 billion.
[3] The fund is not estimated to be exhausted within the projection period.

F. ESTIMATES FOR OASDI AND HI, SEPARATE AND COMBINED

In this appendix, long-range actuarial estimates for the OASDI and Hospital Insurance (HI) programs are presented separately and on a combined basis. These estimates facilitate analysis of the adequacy of the income and assets of these programs relative to their cost under current law. Estimates for the Supplementary Medical Insurance (SMI) program are not included in this appendix because adequate financing is guaranteed in the law, and because the SMI program is not financed through a payroll tax.

The emphasis in this appendix on combined operations, while significant, should not obscure the analysis of the financial status of the individual trust funds, which are legally separate and cannot be commingled. In addition, the factors which determine the costs of the OASI, DI, and HI programs differ substantially.

1. Estimates as a Percentage of Taxable Payroll

Comparing and combining cost and income rates for the OASDI and HI programs as percentages of taxable payroll requires a note of caution. The taxable payrolls for the HI program are larger than those estimated for the OASDI program because (1) a larger maximum taxable amount was established for the HI program in 1991, with the maximum being eliminated altogether for the HI program in 1994, (2) a larger proportion of Federal, State, and local government employees have their wages covered under the HI program, and (3) the earnings of railroad workers are included directly in the HI taxable payroll but not in the OASDI taxable payroll (railroad contributions for the equivalent of OASDI benefits are accounted for in a net interchange that occurs annually between the OASDI and Railroad Retirement programs). As a result, the HI taxable payroll is about 25 percent larger than the OASDI taxable payroll throughout the long-range period. Nonetheless, combined OASDI and HI rates shown in this section are computed by adding the separately derived rates for the programs. The resulting combined rates may be interpreted as those applicable to the taxable payroll in the amount of the OASDI payroll, with the separate HI rates being additionally applicable to the excess of the HI payroll over the OASDI payroll.

As with the OASI and DI Trust Funds, income to the HI Trust Fund comes primarily from contributions paid by employees, employers, and self-employed persons. The combined OASDI and HI contribution rate for employees and their employers is often referred to as the FICA tax, because it is authorized by the Federal Insurance Contributions Act. Contribution rates for the OASDI and HI programs are shown in table VI.F1.

Table VI.F1.—Contribution Rates for the OASDI and HI Programs
[In percent]

Calendar years	Employees and employers, each			Self employed		
	OASDI	HI	Combined	OASDI	HI	Combined
1966	3.85	0.35	4.20	5.80	0.35	6.15
1967	3.90	.50	4.40	5.90	.50	6.40
1968	3.80	.60	4.40	5.80	.60	6.40
1969-70	4.20	.60	4.80	6.30	.60	6.90
1971-72	4.60	.60	5.20	6.90	.60	7.50
1973	4.85	1.00	5.85	7.00	1.00	8.00
1974-77	4.95	.90	5.85	7.00	.90	7.90
1978	5.05	1.00	6.05	7.10	1.00	8.10
1979-80	5.08	1.05	6.13	7.05	1.05	8.10
1981	5.35	1.30	6.65	8.00	1.30	9.30
1982-83	5.40	1.30	6.70	8.05	1.30	9.35
1984[1]	5.70	1.30	7.00	11.40	2.60	14.00
1985	5.70	1.35	7.05	11.40	2.70	14.10
1986-87	5.70	1.45	7.15	11.40	2.90	14.30
1988-89	6.06	1.45	7.51	12.12	2.90	15.02
1990 and later	6.20	1.45	7.65	12.40	2.90	15.30

[1] See footnote 1 under table VI.A1 in the appendix titled "History of OASI and DI Trust Fund Operations" for a description of tax credits allowed against the combined OASDI and HI taxes on net earnings from self-employment in 1984-89.

Table VI.F2 shows estimated annual income rates and cost rates for the OASDI program, the HI program, and the combined OASDI and HI programs, based on the low cost, intermediate, and high cost sets of assumptions (alternatives I, II, and III) described earlier in this report. These annual rates are intended to indicate the cash-flow operation of the programs. Therefore, income rates exclude interest earned on trust fund assets and cost rates exclude the cost of accumulating ending target trust fund balances. Table VI.F2 also shows the differences between income rates and cost rates, called balances. Estimates shown for the combined trust funds are theoretical because no authority currently exists for borrowing by or transfers among these trust funds.

Under all three sets of assumptions, the combined OASDI and HI cost rate is projected to rise above current levels, with the sharpest increase occurring during the period 2010-30. Under the high cost set of assumptions, annual deficits are projected to occur beginning in 2012, and to continue for the remainder of the 75-year projection period. The cost rate is projected to rise to about four times its current level by the end of the projection period. Under the intermediate assumptions, annual deficits begin in 2017, with the cost rate more than doubling by the end of the projection period. Under the low cost assumptions, the cost rate is projected to increase by nearly 50 percent, by the end of the period, with annual deficits beginning in 2024.

Table VI.F2.—Estimated OASDI and HI Annual Income Rates, Cost Rates, and Balances,[1] Calendar Years 2003-80

[As a percentage of taxable payroll[1]]

	OASDI			HI			Combined		
Calendar year	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance
Intermediate:									
2003	12.70	10.89	1.81	3.05	2.92	0.13	15.76	13.81	1.94
2004	12.69	10.82	1.88	3.06	2.92	.15	15.76	13.73	2.02
2005	12.70	10.73	1.97	3.07	2.90	.17	15.77	13.63	2.14
2006	12.70	10.65	2.05	3.07	2.89	.17	15.77	13.55	2.22
2007	12.72	10.67	2.05	3.08	2.90	.18	15.79	13.57	2.23
2008	12.73	10.73	2.00	3.09	2.92	.17	15.82	13.65	2.17
2009	12.74	10.84	1.90	3.10	2.96	.14	15.84	13.80	2.04
2010	12.76	10.99	1.78	3.11	3.00	.10	15.87	13.99	1.88
2011	12.80	11.16	1.64	3.13	3.06	.07	15.93	14.22	1.71
2012	12.82	11.37	1.45	3.14	3.11	.03	15.96	14.49	1.48
2015	12.88	12.18	.70	3.17	3.31	-.14	16.05	15.49	.56
2020	12.99	13.92	-.93	3.23	3.78	-.56	16.21	17.70	-1.49
2025	13.09	15.61	-2.52	3.28	4.39	-1.11	16.37	20.01	-3.63
2030	13.18	16.88	-3.70	3.33	5.10	-1.77	16.50	21.98	-5.48
2035	13.23	17.54	-4.31	3.35	5.81	-2.46	16.58	23.35	-6.77
2040	13.26	17.76	-4.50	3.36	6.46	-3.09	16.62	24.21	-7.60
2045	13.27	17.91	-4.63	3.37	7.04	-3.67	16.64	24.94	-8.30
2050	13.30	18.18	-4.89	3.38	7.59	-4.20	16.68	25.77	-9.09
2055	13.32	18.57	-5.24	3.39	8.16	-4.76	16.72	26.72	-10.00
2060	13.35	18.88	-5.53	3.41	8.80	-5.40	16.75	27.68	-10.93
2065	13.37	19.15	-5.79	3.41	9.53	-6.11	16.78	28.68	-11.90
2070	13.39	19.47	-6.08	3.42	10.34	-6.92	16.81	29.81	-13.00
2075	13.41	19.79	-6.38	3.43	11.19	-7.75	16.84	30.98	-14.14
2080	13.43	20.09	-6.67	3.44	12.10	-8.67	16.87	32.20	-15.33
Low Cost:									
2003	12.70	10.76	1.94	3.05	2.83	.22	15.75	13.59	2.16
2004	12.69	10.61	2.08	3.06	2.78	.28	15.75	13.39	2.36
2005	12.70	10.46	2.24	3.06	2.72	.35	15.76	13.17	2.59
2006	12.70	10.31	2.39	3.07	2.66	.40	15.76	12.97	2.79
2007	12.71	10.23	2.48	3.07	2.62	.46	15.78	12.85	2.93
2008	12.72	10.18	2.53	3.08	2.58	.50	15.80	12.77	3.03
2009	12.73	10.19	2.54	3.09	2.57	.52	15.81	12.76	3.06
2010	12.74	10.23	2.51	3.10	2.56	.54	15.84	12.79	3.04
2011	12.78	10.31	2.47	3.12	2.56	.56	15.89	12.87	3.02
2012	12.79	10.42	2.37	3.13	2.56	.57	15.92	12.98	2.94
2015	12.83	11.07	1.76	3.15	2.57	.57	15.98	13.65	2.33
2020	12.92	12.50	.42	3.19	2.68	.52	16.11	15.17	.94
2025	13.00	13.76	-.76	3.24	2.83	.41	16.24	16.59	-.35
2030	13.06	14.58	-1.52	3.27	2.98	.29	16.33	17.57	-1.23
2035	13.09	14.83	-1.74	3.29	3.14	.15	16.38	17.97	-1.59
2040	13.10	14.68	-1.58	3.29	3.28	.01	16.39	17.96	-1.57
2045	13.10	14.49	-1.39	3.29	3.44	-.16	16.39	17.93	-1.54
2050	13.11	14.44	-1.33	3.29	3.65	-.36	16.40	18.09	-1.69
2055	13.12	14.48	-1.36	3.29	3.92	-.63	16.41	18.40	-1.99
2060	13.12	14.45	-1.33	3.29	4.23	-.94	16.42	18.68	-2.26
2065	13.12	14.34	-1.21	3.29	4.58	-1.29	16.41	18.91	-2.50
2070	13.12	14.26	-1.14	3.29	4.97	-1.68	16.41	19.23	-2.82
2075	13.12	14.26	-1.13	3.29	5.38	-2.09	16.41	19.63	-3.22
2080	13.13	14.32	-1.19	3.29	5.83	-2.53	16.42	20.15	-3.73

Table VI.F2.—Estimated OASDI and HI Annual Income Rates, Cost Rates, and Balances,[1] Calendar Years 2003-80 (Cont.)
[As a percentage of taxable payroll[1]]

	OASDI			HI			Combined		
Calendar year	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance
High Cost:									
2003	12.71	11.21	1.50	3.05	3.05	2/	15.77	14.26	1.50
2004	12.70	11.14	1.56	3.07	3.09	-0.02	15.77	14.22	1.54
2005	12.71	11.07	1.64	3.07	3.10	-.03	15.78	14.18	1.60
2006	12.72	11.26	1.46	3.07	3.18	-.10	15.79	14.43	1.36
2007	12.74	11.55	1.19	3.09	3.25	-.17	15.83	14.80	1.03
2008	12.76	11.62	1.14	3.10	3.31	-.21	15.85	14.93	.93
2009	12.77	11.83	.94	3.11	3.42	-.31	15.88	15.25	.63
2010	12.79	12.04	.75	3.12	3.55	-.42	15.91	15.59	.32
2011	12.84	12.30	.54	3.15	3.68	-.53	15.99	15.98	2/
2012	12.86	12.60	.27	3.16	3.82	-.66	16.02	16.41	-.39
2015	12.95	13.51	-.57	3.20	4.30	-1.10	16.15	17.81	-1.66
2020	13.07	15.53	-2.46	3.27	5.40	-2.13	16.34	20.92	-4.58
2025	13.20	17.66	-4.46	3.33	6.89	-3.56	16.53	24.55	-8.02
2030	13.31	19.45	-6.14	3.39	8.80	-5.41	16.70	28.25	-11.55
2035	13.39	20.67	-7.28	3.43	10.86	-7.43	16.82	31.52	-14.71
2040	13.44	21.46	-8.02	3.46	12.79	-9.34	16.90	34.25	-17.35
2045	13.49	22.20	-8.71	3.48	14.48	-11.00	16.97	36.68	-19.71
2050	13.54	23.08	-9.53	3.50	15.87	-12.37	17.05	38.95	-21.90
2055	13.60	24.08	-10.48	3.53	17.09	-13.55	17.14	41.17	-24.03
2060	13.66	25.06	-11.39	3.56	18.43	-14.87	17.22	43.49	-26.27
2065	13.72	26.07	-12.34	3.59	19.95	-16.36	17.31	46.02	-28.71
2070	13.78	27.15	-13.36	3.62	21.66	-18.04	17.40	48.81	-31.41
2075	13.84	28.18	-14.34	3.65	23.43	-19.78	17.49	51.61	-34.12
2080	13.89	29.08	-15.19	3.67	25.34	-21.67	17.56	54.42	-36.85

[1] The taxable payroll for HI is significantly larger than the taxable payroll for OASDI because the HI taxable maximum amount was eliminated beginning 1994, and because HI covers all Federal civilian employees, including those hired before 1984, all State and local government employees hired after April 1, 1986, and railroad employees. Combined OASDI and HI rates are computed as the sum of the separately derived rates for each program.

[2] Between -0.005 and 0.005 percent of taxable payroll.

Notes:
1. The income rate excludes interest income and certain transfers from the General Fund of the Treasury.
2. Totals do not necessarily equal the sums of rounded components.

Tables VI.F3 and VI.F4 show the estimates of summarized OASDI and HI income rates, cost rates and balances for various time periods, based on all three sets of assumptions. In table VI.F3 values are summarized over the three 25-year subperiods (excluding the beginning fund balances and the cost of accumulating ending fund targets). In table VI.F4 values are summarized over the 25-year, 50-year, and 75-year valuation periods (for which beginning fund balances are included in the summarized income rates, and the cost of accumulating an ending fund balance equal to 100 percent of annual cost by the end of the period is included in the summarized cost rates). Estimates shown for the combined trust funds are theoretical because no authority currently exists for borrowing by or transfers among these trust funds.

Table VI.F3.—Summarized OASDI and HI Income Rates, Cost Rates, and Balances[1] for 25-Year Subperiods,[2] Calendar Years 2003-77

[As a percentage of taxable payroll[1]]

Subperiod	OASDI			HI			Combined		
	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance	Income rate	Cost rate	Balance
Intermediate:									
2003-27	12.86	12.53	0.33	3.16	3.44	-0.27	16.03	15.97	0.06
2028-52	13.24	17.60	-4.36	3.36	6.30	-2.94	16.60	23.90	-7.30
2053-77	13.36	19.12	-5.76	3.41	9.48	-6.07	16.77	28.60	-11.83
Low Cost:									
2003-27	12.82	11.50	1.32	3.14	2.67	.47	15.96	14.17	1.79
2028-52	13.09	14.61	-1.52	3.28	3.28	.01	16.38	17.89	-1.51
2053-77	13.12	14.37	-1.25	3.29	4.57	-1.28	16.42	18.94	-2.53
High Cost:									
2003-27	12.92	13.80	-.88	3.19	4.56	-1.37	16.11	18.36	-2.25
2028-52	13.42	21.22	-7.80	3.45	12.30	-8.85	16.87	33.52	-16.65
2053-77	13.71	25.91	-12.20	3.58	19.85	-16.26	17.29	45.76	-28.46

[1] The taxable payroll for HI is significantly larger than the taxable payroll for OASDI because the HI taxable maximum amount was eliminated beginning 1994, and because HI covers all Federal civilian employees, including those hired before 1984, all State and local government employees hired after April 1, 1986, and railroad employees. Combined OASDI and HI rates are computed as the sum of the separately derived rates for each program.

[2] For 25-year subperiods, income rates do not include beginning trust fund balances and cost rates do not include the cost of reaching ending fund targets.

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

Deficits are projected for each 25-year subperiod of the 75-year projection period under the high cost assumptions for the combined OASDI and HI system (table VI.F3, excluding beginning trust fund balances and the cost of ending fund targets). Under the intermediate assumptions, deficits of smaller magnitude than those for the high cost set of assumptions are projected for the second and third 25-year subperiods and a positive balance is projected for the first 25-year subperiod. Under the low cost assumptions, the combined OASDI and HI system is projected to show a positive balance for the first 25-year subperiod and relatively small deficits for the second and third 25-year subperiods.

Table VI.F4.—Summarized OASDI and HI Income Rates and Cost Rates[1] for Valuation Periods,[2] Calendar Years 2003-77

[As a percentage of taxable payroll[1]]

Valuation period	OASDI			HI			Combined		
	Income rate	Cost rate	Actuarial balance	Income rate	Cost rate	Actuarial balance	Income rate	Cost rate	Actuarial balance
Intermediate:									
25-years:									
2003-27	14.34	13.09	1.26	3.37	3.60	-0.23	17.71	16.69	1.03
50-years:									
2003-52	13.89	14.84	-.95	3.36	4.73	-1.36	17.25	19.57	-2.32
75-years:									
2003-77	13.78	15.70	-1.92	3.37	5.77	-2.40	17.15	21.47	-4.32
Low Cost:									
25-years:									
2003-27	14.28	11.98	2.31	3.33	2.77	.56	17.61	14.75	2.86
50-years:									
2003-52	13.80	12.97	.83	3.31	2.98	.33	17.11	15.95	1.16
75-years:									
2003-77	13.65	13.23	.42	3.31	3.35	-.04	16.96	16.58	.38
High Cost:									
25-years:									
2003-27	14.40	14.45	-.05	3.39	4.84	-1.45	17.79	19.29	-1.50
50-years:									
2003-52	14.00	17.20	-3.20	3.41	8.08	-4.67	17.41	25.28	-7.87
75-years:									
2003-77	13.93	19.00	-5.07	3.45	10.73	-7.28	17.38	29.73	-12.35

[1] The taxable payroll for HI is significantly larger than the taxable payroll for OASDI because the HI taxable maximum amount was eliminated beginning 1994, and because HI covers all Federal civilian employees, including those hired before 1984, all State and local government employees hired after April 1, 1986, and railroad employees. Combined OASDI and HI rates are computed as the sum of the separately derived rates for each program.

[2] Income rates include beginning trust fund balances and cost rates include the cost of reaching an ending fund target equal to 100 percent of annual cost by the end of the period.

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

Under the high cost assumptions, the combined OASDI and HI system is projected to experience large actuarial deficits for the 25-year, 50-year, and 75-year valuation periods (table VI.F4, including beginning trust fund balances and the cost of ending fund targets). Under the intermediate assumptions, actuarial deficits smaller than those for the high cost assumptions are projected for the 50-year and the 75-year valuation periods, and a positive actuarial balance is projected for the 25-year valuation period. Under the low cost assumptions, the combined OASDI and HI system is projected to have positive actuarial balances for each of the three valuation periods.

2. Estimates as a Percentage of Gross Domestic Product

This section presents long-range projections of the operations of the combined Old-Age and Survivors Insurance and Disability Insurance (OASI and DI) Trust Funds and of the Hospital Insurance (HI) Trust Fund expressed as a percentage of gross domestic product (GDP). While expressing these fund operations as a percentage of taxable payroll is the most useful approach for assessing the financial status of the programs (see table IV.B1 and section IV.B.1), analyzing them as a percentage of GDP provides an additional perspective on these fund operations in relation to the total value of goods and services produced in the United States.

Table VI.F5 shows estimated income excluding interest, total cost, and the resulting balance of the combined OASI and DI Trust Funds, of the HI Trust Fund, and of the combined OASI, DI, and HI Trust Funds, expressed as percentages of GDP on the basis of each of the three alternative sets of assumptions. The estimated GDP on which these percentages are based is also shown in table VI.F5. For OASDI, income excluding interest consists of payroll-tax contributions, proceeds from taxation of benefits, and various reimbursements from the General Fund of the Treasury. Total cost consists of benefit payments, administrative expenses, net transfers from the trust funds to the Railroad Retirement program, and payments for vocational rehabilitation services for disabled beneficiaries. For HI, income excluding interest consists of payroll-tax contributions (including contributions from railroad employment) and proceeds from taxation of OASDI benefits. Total cost consists of outlays (benefits and administrative expenses) for insured beneficiaries. Both the HI income and cost are on an incurred basis.

The OASDI annual balance (income excluding interest, less cost) as a percentage of GDP is projected to be positive on the basis of the low cost assumptions until 2022. After 2021, deficits increase to a peak in about 2034, and decrease thereafter. The OASDI balance is projected to be positive until 2018 on the basis of the intermediate assumptions and until 2014 on the basis of the high cost assumptions, at which time balances become permanently negative, with generally increasing deficits. The projected HI balance as a percentage of GDP, is positive through 2040 on the basis of the low cost alternative. The HI balance is projected to remain positive through 2012 under the intermediate alternative and 2003 under the high cost alternative, with deficits increasing steadily thereafter. The combined OASDI and HI balance as a percentage of GDP is projected to be positive through 2023 under the low cost assumptions, through 2016 under the intermediate assumptions, and through 2010 under the high cost assumptions. Between 2010 and about 2035, under all three assumptions, both the OASDI and HI balances as percentages of GDP are projected to decline (or deficits increase)

substantially because the baby-boom generation reaches retirement age during these years. After balances cease to be positive under the intermediate and high cost assumptions, the annual deficits increase fairly steadily for the OASDI and HI programs, both separately and combined.

By 2080, the combined OASDI and HI balances as percentages of GDP, are projected to range from a deficit of 1.64 percent for the low cost assumptions to a deficit of 13.65 percent for the high cost assumptions. Projected balances differ by a much smaller amount for the tenth year, 2012, ranging from a positive balance of 1.22 percent for the low cost assumptions to a deficit of 0.23 percent for the high cost assumptions.

The summarized long-range (75-year) balance as a percentage of GDP for the combined OASDI and HI programs varies among the three alternatives, by a relatively large amount (from a positive balance of 0.16 percent, based on the low cost assumptions, to a deficit of 5.09 percent, based on the high cost assumptions). The 25-year summarized balance varies by a smaller amount (from a positive balance of 1.20 percent to a deficit of 0.71 percent). Summarized rates are calculated on the present-value basis including the trust fund balances on January 1, 2003 and the cost of reaching a target trust fund level equal to 100 percent of annual cost at the end of the period. (See section IV.B.4 for further explanation.)

Table VI.F5.—OASDI and HI Annual and Summarized Income, Cost, and Balance as a Percentage of GDP, Calendar Years 2003-80

	Percentage of GDP									
	OASDI			HI			Combined			GDP in dollars (billions)
Calendar year	Income[1]	Cost	Balance	Income[1]	Cost	Balance	Income[1]	Cost	Balance	
Intermediate:										
2003	5.08	4.38	0.71	1.51	1.44	0.07	6.59	5.82	0.77	$10,915
2004	5.05	4.33	.72	1.51	1.44	.07	6.57	5.77	.79	11,518
2005	5.06	4.29	.78	1.52	1.43	.08	6.58	5.72	.86	12,182
2006	5.05	4.25	.80	1.52	1.43	.09	6.57	5.68	.89	12,888
2007	5.05	4.24	.81	1.52	1.43	.09	6.57	5.67	.89	13,625
2008	5.04	4.26	.78	1.52	1.44	.08	6.56	5.70	.86	14,372
2009	5.03	4.29	.74	1.53	1.46	.07	6.56	5.75	.81	15,137
2010	5.03	4.34	.69	1.53	1.48	.05	6.56	5.82	.74	15,925
2011	5.04	4.40	.64	1.54	1.50	.04	6.57	5.90	.67	16,740
2012	5.03	4.47	.56	1.54	1.53	.01	6.57	6.00	.58	17,575
2015	5.03	4.77	.27	1.55	1.62	-.07	6.58	6.39	.20	20,245
2020	5.03	5.40	-.37	1.56	1.83	-.27	6.59	7.23	-.64	25,453
2025	5.03	6.00	-.98	1.57	2.11	-.53	6.60	8.11	-1.51	31,911
2030	5.01	6.43	-1.42	1.58	2.43	-.84	6.59	8.86	-2.26	40,025
2035	4.99	6.62	-1.64	1.58	2.74	-1.16	6.57	9.36	-2.80	50,280
2040	4.95	6.65	-1.69	1.57	3.02	-1.45	6.53	9.66	-3.14	63,113
2045	4.92	6.64	-1.73	1.56	3.26	-1.70	6.48	9.90	-3.43	79,037
2050	4.88	6.68	-1.80	1.55	3.48	-1.93	6.43	10.17	-3.73	98,759
2055	4.85	6.76	-1.92	1.54	3.71	-2.17	6.39	10.47	-4.08	123,302
2060	4.81	6.81	-2.00	1.54	3.97	-2.43	6.34	10.78	-4.44	154,043
2065	4.77	6.85	-2.08	1.53	4.26	-2.73	6.30	11.10	-4.81	192,407
2070	4.73	6.89	-2.16	1.52	4.58	-3.06	6.25	11.47	-5.22	240,146
2075	4.70	6.94	-2.25	1.51	4.91	-3.40	6.20	11.85	-5.65	299,479
2080	4.66	6.98	-2.32	1.50	5.26	-3.77	6.15	12.24	-6.09	373,322
Summarized rates:[2]										
25-year:										
2003-27 . . .	5.63	5.13	.49	1.64	1.76	-.11	7.27	6.89	.38	
50-year:										
2003-52 . . .	5.35	5.71	-.36	1.61	2.26	-.65	6.96	7.97	-1.01	
75-year										
2003-77 . . .	5.22	5.95	-.73	1.59	2.70	-1.11	6.82	8.65	-1.84	
Low Cost:										
2003	5.07	4.33	.74	1.51	1.40	.11	6.57	5.73	.85	11,003
2004	5.08	4.26	.83	1.52	1.38	.14	6.60	5.63	.96	11,622
2005	5.09	4.20	.89	1.52	1.35	.17	6.61	5.54	1.06	12,250
2006	5.08	4.14	.94	1.52	1.32	.20	6.60	5.46	1.14	12,892
2007	5.09	4.11	.99	1.52	1.30	.23	6.61	5.40	1.21	13,560
2008	5.09	4.08	1.00	1.53	1.28	.25	6.61	5.36	1.25	14,250
2009	5.09	4.08	1.00	1.53	1.27	.26	6.61	5.35	1.26	14,961
2010	5.08	4.09	.99	1.53	1.27	.26	6.62	5.36	1.26	15,688
2011	5.10	4.12	.98	1.54	1.27	.27	6.64	5.39	1.25	16,426
2012	5.10	4.16	.94	1.54	1.26	.28	6.64	5.42	1.22	17,173
2015	5.10	4.41	.69	1.55	1.27	.28	6.65	5.68	.98	19,532
2020	5.12	4.96	.16	1.57	1.31	.25	6.68	6.27	.41	24,028
2025	5.13	5.43	-.31	1.58	1.38	.20	6.71	6.81	-.11	29,481
2030	5.13	5.73	-.61	1.59	1.45	.14	6.72	7.18	-.47	36,248
2035	5.11	5.80	-.69	1.59	1.52	.07	6.70	7.32	-.62	44,756
2040	5.10	5.72	-.62	1.58	1.58	3/	6.68	7.30	-.62	55,348
2045	5.08	5.62	-.55	1.58	1.65	-.08	6.65	7.27	-.62	68,445
2050	5.06	5.58	-.52	1.57	1.74	-.17	6.63	7.32	-.69	84,582
2055	5.04	5.57	-.53	1.57	1.86	-.30	6.60	7.44	-.83	104,553
2060	5.02	5.53	-.52	1.56	2.00	-.44	6.58	7.54	-.96	129,465
2065	5.00	5.47	-.47	1.55	2.16	-.61	6.55	7.63	-1.08	160,503
2070	4.98	5.41	-.44	1.55	2.33	-.79	6.52	7.75	-1.23	198,967
2075	4.95	5.39	-.44	1.54	2.51	-.98	6.49	7.91	-1.41	246,464
2080	4.93	5.39	-.46	1.53	2.71	-1.18	6.47	8.11	-1.64	305,072

Table VI.F5.—OASDI and HI Annual and Summarized Income, Cost, and Balance as a Percentage of GDP, Calendar Years 2003-80 (Cont.)

	Percentage of GDP									GDP in dollars (billions)
	OASDI			HI			Combined			
Calendar year	Income[1]	Cost	Balance	Income[1]	Cost	Balance	Income[1]	Cost	Balance	
Low Cost (cont.):										
Summarized rates: [2]										
25-year:										
2003-27 . . .	5.70	4.78	0.92	1.65	1.36	0.28	7.34	6.14	1.20	
50-year:										
2003-52 . . .	5.45	5.12	.33	1.62	1.45	.17	7.07	6.57	.50	
75-year										
2003-77 . . .	5.35	5.19	.16	1.61	1.61	-.01	6.96	6.80	.16	
High Cost:										
2003	5.13	4.49	.64	1.50	1.50	[3]	6.64	5.99	.64	$10,707
2004	4.98	4.44	.54	1.51	1.52	-.01	6.49	5.96	.53	11,398
2005	5.02	4.39	.64	1.51	1.53	-.02	6.54	5.92	.62	12,227
2006	5.00	4.44	.56	1.51	1.56	-.05	6.51	6.00	.51	12,937
2007	4.96	4.51	.45	1.51	1.59	-.08	6.47	6.10	.37	13,868
2008	4.95	4.52	.43	1.51	1.62	-.10	6.46	6.14	.32	15,025
2009	4.96	4.61	.35	1.52	1.67	-.15	6.48	6.28	.20	15,936
2010	4.97	4.69	.28	1.53	1.73	-.21	6.49	6.42	.07	16,809
2011	4.98	4.78	.20	1.53	1.79	-.26	6.51	6.57	-.06	17,731
2012	4.97	4.87	.09	1.54	1.86	-.32	6.51	6.73	-.23	18,703
2015	4.96	5.19	-.23	1.55	2.08	-.53	6.51	7.27	-.76	21,866
2020	4.95	5.89	-.94	1.56	2.57	-1.02	6.51	8.46	-1.96	28,177
2025	4.93	6.61	-1.68	1.57	3.25	-1.68	6.50	9.85	-3.36	36,206
2030	4.90	7.18	-2.27	1.58	4.09	-2.52	6.48	11.27	-4.79	46,481
2035	4.87	7.52	-2.66	1.57	4.98	-3.41	6.44	12.50	-6.06	59,575
2040	4.82	7.71	-2.89	1.56	5.79	-4.22	6.38	13.50	-7.11	76,081
2045	4.77	7.87	-3.09	1.55	6.47	-4.91	6.32	14.33	-8.01	96,656
2050	4.72	8.06	-3.34	1.54	6.99	-5.45	6.27	15.05	-8.79	122,273
2055	4.68	8.29	-3.62	1.53	7.42	-5.89	6.21	15.72	-9.50	154,303
2060	4.63	8.51	-3.87	1.53	7.90	-6.37	6.16	16.40	-10.25	194,554
2065	4.58	8.72	-4.14	1.52	8.43	-6.91	6.10	17.15	-11.05	244,766
2070	4.54	8.95	-4.41	1.51	9.03	-7.52	6.05	17.98	-11.93	307,391
2075	4.49	9.16	-4.67	1.50	9.63	-8.13	5.99	18.79	-12.80	385,540
2080	4.44	9.31	-4.87	1.49	10.27	-8.78	5.93	19.58	-13.65	483,424
Summarized rates: [2]										
25-year:										
2003-27 . . .	5.55	5.57	-.02	1.64	2.33	-.69	7.19	7.89	-.71	
50-year:										
2003-52 . . .	5.24	6.44	-1.20	1.61	3.75	-2.15	6.85	10.19	-3.34	
75-year										
2003-77 . . .	5.09	6.94	-1.85	1.59	4.83	-3.24	6.68	11.77	-5.09	

[1] Income for individual years excludes interest on the trust funds. Interest is implicitly reflected in all summarized values.
[2] Summarized rates are calculated on the present-value basis including the value of the trust funds on January 1, 2003 and the cost of reaching a target trust fund level equal to 100 percent of annual cost at the end of the period.
[3] Between -0.005 and 0.005 percent of GDP.

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

The difference between trust fund operations expressed as percentages of taxable payroll and those expressed as percentages of GDP can be understood by analyzing the estimated ratios of OASDI taxable payroll to GDP, which are presented in table VI.F6. HI taxable payroll is about 25 percent larger than the OASDI taxable payroll throughout the long-range period (see appendix F.1 for a detailed description of the difference). The cost as a per-

centage of GDP is approximately equal to the cost as a percentage of taxable payroll multiplied by the ratio of taxable payroll to GDP.

Table VI.F6.—Ratio of OASDI Taxable Payroll to GDP, Calendar Years 2003-80

Calendar year	Intermediate	Low Cost	High Cost
2003	0.402	0.402	0.401
2004	.400	.401	.399
2005	.399	.402	.396
2006	.399	.402	.394
2007	.398	.401	.391
2008	.397	.401	.389
2009	.396	.401	.389
2010	.395	.400	.390
2011	.394	.400	.388
2012	.393	.399	.387
2015	.391	.398	.384
2020	.388	.397	.379
2025	.385	.395	.374
2030	.381	.393	.369
2035	.378	.391	.364
2040	.374	.390	.359
2045	.371	.388	.354
2050	.368	.386	.349
2055	.364	.385	.344
2060	.361	.383	.339
2065	.357	.381	.335
2070	.354	.380	.330
2075	.351	.378	.325
2080	.347	.376	.320

Projections of GDP are based on the projected increases in U.S. employment, labor productivity, average hours worked, and the GDP implicit price deflator. Projections of taxable payroll reflect the projected growth in GDP, along with assumed changes in the ratio of worker compensation to GDP, the ratio of earnings to worker compensation, the ratio of OASDI covered earnings to total earnings, and the ratio of taxable to total covered earnings.

Over the long-range period, projected increases in taxable payroll differ from projected increases in GDP primarily due to the assumed trend in the ratio of wages to total employee compensation—i.e., wages plus fringe benefits. The ratio of earnings to total worker compensation declined at an average annual rate of 0.20 percent for the 40 years from 1961 to 2001. For the 10-year periods 1961-71, 1971-81, 1981-91 the ratio declined by 0.34, 0.60, and 0.13 percent, respectively. For the 10-year period 1991-2001 the ratio increased by 0.29 percent. Ultimate future annual rates of decline in the ratio of earnings to employee compensation are assumed to be 0.1, 0.2, and 0.3 percent for the low cost, intermediate, and high cost assumptions, respectively. An additional factor that has made the overall ratio of taxable payroll to GDP decline in recent years is the decline in the ratio of taxable wages to covered wages, as a result of the relatively greater increases in wages for persons with wages above the contribution and benefit base. This decline in the taxable ratio is assumed to continue at a slower pace through 2012, with no further decline thereafter.

3. Estimates in Dollars

This section presents long-range projections in dollars of the operations of the combined OASI and DI Trust Funds and in some cases the HI Trust Fund. It provides the means to track the progress of the funds during the projection period. Meaningful comparison of current dollar values over long periods of time can be difficult because of the tendency toward inflation. Some means of removing inflation is thus generally desirable. Several economic series, or indices, are provided to allow current dollars to be adjusted for changes in prices, wages, and certain other aspects of economic growth during the projection period.

The selection of a particular index for adjustment of current dollars depends upon the analyst's decision as to which index provides the most useful standard for adjusting dollar amounts, over time, to create values that are appropriately comparable. Table VI.F7 presents five such indices for adjustment. Adjustment of any series of values is accomplished by dividing the value for each year by the corresponding index values for the year. This adjustment removes the inflation in the index from the series of values.

One of the most common forms of standardization is based on some measure of change in the prices of consumer goods. One such price index is the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W, hereafter referred to as CPI) which is published by the Bureau of Labor Statistics, Department of Labor. This is the index used to determine annual increases in OASDI monthly benefits payable after the year of initial eligibility. The CPI is assumed to increase ultimately at annual rates of 2.0, 3.0, and 4.0 percent for the low cost, intermediate, and high cost sets of assumptions, respectively. Constant-dollar values (those adjusted by dividing by the CPI) indicate the relative purchasing power of the values over time. Constant-dollar values are provided in table VI.F8.

Another type of standardization combines the effects of price inflation and real-wage growth. The wage index presented here is the SSA average wage index, as defined in section 215(i)(1)(G) of the Social Security Act. This index is used to make annual adjustments to many earnings-related quantities embodied in the Social Security Act, such as the contribution and benefit base. The average annual wage is assumed to increase ultimately by 3.6, 4.1, and 4.6 percent under the low cost, intermediate, and high cost assumptions, respectively. Wage-indexed values indicate the level of a series relative to the standard-of-living of workers over time.

The taxable payroll index adjusts for the effects of changes in the number of workers and changes in the proportion of earnings that are taxable, as well as for the effects of price inflation and real-wage growth. The OASDI taxable payroll consists of all earnings subject to OASDI taxation, adjusted for the lower effective tax rate on multiple-employer excess wages. Values adjusted by dividing by the taxable payroll indicate the percentage of payroll that each value represents, and thus the extent to which the series of values increases or decreases as a percent of payroll over time.

The GDP index adjusts for the growth in the aggregate amount of goods and services produced in the United States. Values adjusted by GDP (see appendix VI.F.2) indicate their relative share of the total output of the economy. No explicit assumptions are made about growth in taxable payroll or GDP. These series are computed reflecting the other more basic demographic and economic assumptions, as discussed in sections V.A and V.B, respectively.

Discounting at the rate of interest is another way of adjusting current dollars. The series of interest-rate factors included here is based on the average of the assumed annual interest rates for special public-debt obligations issuable to the trust funds for each year. This series is slightly different from the interest rates used to create summarized values elsewhere in this report, where the actual yield on currently-held trust fund assets is used for each year. Ultimate nominal interest rates, which, in practice, are compounded semiannually, are assumed to be approximately 5.7, 6.0, and 6.2 percent for the low cost, intermediate, and high cost assumptions, respectively.

Table VI.F7.—Selected Economic Variables, Calendar Years 2002-80
[GDP and taxable payroll in billions]

Calendar year	Adjusted CPI[1]	SSA average wage index[2]	Taxable payroll[3]	Gross domestic product	Compound interest-rate factor[4]
Intermediate:					
2002	97.70	$33,476.75	$4,213	$10,445	0.9531
2003	100.00	34,730.66	4,387	10,915	1.0000
2004	102.39	36,202.65	4,612	11,518	1.0626
2005	105.15	37,733.96	4,866	12,182	1.1311
2006	108.22	39,338.44	5,140	12,888	1.2044
2007	111.47	41,033.61	5,418	13,625	1.2817
2008	114.81	42,771.99	5,702	14,372	1.3621
2009	118.26	44,566.15	5,994	15,137	1.4468
2010	121.80	46,409.05	6,294	15,925	1.5352
2011	125.45	48,325.83	6,601	16,740	1.6287
2012	129.22	50,293.80	6,911	17,575	1.7279
2015	141.20	56,704.95	7,923	20,245	2.0632
2020	163.69	69,129.89	9,876	25,453	2.7728
2025	189.77	84,436.77	12,272	31,911	3.7264
2030	219.99	103,181.85	15,253	40,025	5.0080
2035	255.03	126,323.87	18,987	50,280	6.7303
2040	295.65	154,612.31	23,622	63,113	9.0450
2045	342.74	189,219.39	29,320	79,037	12.1557
2050	397.33	231,372.27	36,302	98,759	16.3362
2055	460.61	282,819.44	44,906	123,302	21.9545
2060	533.97	345,826.67	55,582	154,043	29.5050
2065	619.02	422,895.04	68,778	192,407	39.6522
2070	717.62	517,152.80	85,037	240,146	53.2893
2075	831.91	632,286.63	105,046	299,479	71.6164
2080	964.42	772,985.34	129,710	373,322	96.2464
Low Cost:					
2002	97.87	33,547.79	4,213	10,447	.9531
2003	100.00	34,907.44	4,425	11,003	1.0000
2004	101.98	36,337.05	4,664	11,622	1.0617
2005	104.02	37,740.22	4,920	12,250	1.1255
2006	106.11	39,121.33	5,180	12,892	1.1914
2007	108.22	40,568.05	5,443	13,560	1.2604
2008	110.39	42,055.17	5,716	14,250	1.3333
2009	112.60	43,599.78	5,994	14,961	1.4105
2010	114.84	45,172.07	6,278	15,688	1.4922
2011	117.15	46,792.70	6,567	16,426	1.5786
2012	119.49	48,448.46	6,857	17,173	1.6700
2015	126.80	53,839.99	7,781	19,532	1.9772
2020	140.00	64,068.47	9,532	24,028	2.6198
2025	154.57	76,333.35	11,642	29,481	3.4713
2030	170.66	90,964.55	14,246	36,248	4.5995
2035	188.42	108,612.69	17,509	44,756	6.0943
2040	208.03	129,692.93	21,561	55,348	8.0750
2045	229.69	154,886.85	26,552	68,445	10.6995
2050	253.59	184,945.36	32,673	84,582	14.1769
2055	279.99	220,819.42	40,217	104,553	18.7846
2060	309.13	263,768.82	49,587	129,465	24.8898
2065	341.30	315,097.23	61,212	160,503	32.9791
2070	376.82	376,440.49	75,555	198,967	43.6977
2075	416.04	449,605.62	93,181	246,464	57.8998
2080	459.35	536,886.80	114,829	305,072	76.7178

Table VI.F7.—Selected Economic Variables, Calendar Years 2002-80 (Cont.)
[GDP and taxable payroll in billions]

Calendar year	Adjusted CPI[1]	SSA average wage index[2]	Taxable payroll[3]	Gross domestic product	Compound interest-rate factor[4]
High Cost:					
2002	97.54	$33,417.83	$4,203	$10,417	0.9531
2003	100.00	34,208.13	4,292	10,707	1.0000
2004	102.99	36,009.40	4,545	11,398	1.0713
2005	107.60	38,058.89	4,842	12,227	1.1585
2006	113.89	39,853.26	5,103	12,937	1.2513
2007	120.44	42,279.32	5,416	13,868	1.3568
2008	126.32	45,170.39	5,844	15,025	1.4705
2009	131.55	47,441.85	6,202	15,936	1.5708
2010	136.81	49,588.16	6,548	16,809	1.6710
2011	142.28	51,840.85	6,887	17,731	1.7763
2012	147.97	54,216.93	7,234	18,703	1.8883
2015	166.44	62,031.34	8,398	21,866	2.2684
2020	202.50	77,491.44	10,683	28,177	3.0796
2025	246.38	97,067.37	13,548	36,206	4.1807
2030	299.75	121,656.90	17,157	46,481	5.6756
2035	364.70	152,703.44	21,692	59,575	7.7051
2040	443.71	191,535.30	27,329	76,081	10.4602
2045	539.84	240,156.90	34,245	96,656	14.2004
2050	656.80	300,665.66	42,713	122,273	19.2781
2055	799.10	376,175.17	53,136	154,303	26.1714
2060	972.22	470,698.27	66,038	194,554	35.5294
2065	1,182.86	588,940.29	81,887	244,766	48.2337
2070	1,439.13	736,885.62	101,354	307,391	65.4806
2075	1,750.92	921,996.23	125,284	385,540	88.8945
2080	2,130.26	1,153,884.89	154,821	483,424	120.6805

[1] The CPI used to adjust OASDI benefits is the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), as defined by the Bureau of Labor Statistics, Department of Labor. The values shown are adjusted by dividing the calendar-year annual average CPI by the analogous value for 2003, and multiplying the result by 100, thereby initializing the CPI at 100 for 2003.

[2] The "SSA average wage index" is defined in the glossary as "Average wage index;" it is used in the calculations of initial benefits and the automatic adjustment of the contribution and benefit base and other wage-indexed program amounts.

[3] Taxable payroll consists of total earnings subject to OASDI contribution rates, adjusted to include deemed wages based on military service through calendar year 2001 and to reflect the lower effective contribution rates (compared to the combined employee-employer rate) which apply to multiple-employer "excess wages."

[4] The compound interest-rate factor is based on the average of the assumed annual interest rates for special public-debt obligations issuable to the trust funds in the 12 months of the year, under each alternative.

Table VI.F8 shows estimated operations of the combined OASI and DI Trust Funds in constant 2003 dollars (i.e., adjusted by the CPI indexing series as discussed above). Items included in the table are: income excluding interest, interest income, total income, total cost, and assets at the end of the year. Income excluding interest consists of payroll-tax contributions, income from taxation of benefits, and miscellaneous reimbursements from the General Fund of the Treasury. Cost consists of benefit payments, administrative expenses, net transfers from the OASI and DI Trust Funds to the Railroad

Retirement program under the financial-interchange provisions, and payments for vocational rehabilitation services for disabled beneficiaries. These estimates are based on the low cost, intermediate, and high cost sets of assumptions.

Table VI.F8.—Operations of the Combined OASI and DI Trust Funds, in Constant 2003 Dollars,[1] Calendar Years 2003-80
[In billions]

Calendar year	Income excluding interest	Interest income	Total income	Cost	Assets at end of year
Intermediate:					
2003	$555.0	$87.5	$642.5	$477.9	$1,542.6
2004	568.5	95.1	663.5	487.2	1,682.9
2005	586.7	103.9	690.7	496.8	1,832.7
2006	601.3	113.6	714.9	506.0	1,989.5
2007	617.0	123.7	740.8	518.4	2,153.9
2008	630.7	133.9	764.6	532.9	2,322.9
2009	644.2	143.7	787.9	549.6	2,493.5
2010	657.6	153.5	811.1	567.7	2,664.4
2011	672.1	163.1	835.2	587.3	2,834.7
2012	684.6	172.6	857.2	608.3	3,001.1
2015	721.5	198.7	920.2	683.4	3,452.0
2020	782.3	227.7	1,009.9	839.8	3,920.6
2025	845.2	228.8	1,074.0	1,009.7	3,885.2
2030	912.0	198.1	1,110.1	1,170.2	3,300.2
2035	983.3	136.9	1,120.2	1,305.8	2,199.9
2040[2]	1,057.4	49.7	1,107.1	1,418.8	660.5
Low Cost:					
2003	557.4	88.0	645.4	476.2	1,547.1
2004	579.1	96.6	675.6	485.0	1,707.7
2005	599.3	105.7	705.0	494.5	1,884.7
2006	617.8	115.4	733.2	503.1	2,077.8
2007	638.0	125.8	763.8	514.6	2,286.3
2008	656.8	137.0	793.8	527.2	2,508.0
2009	675.6	148.8	824.4	542.4	2,740.7
2010	694.6	161.3	855.8	559.2	2,983.9
2011	714.7	174.4	889.1	577.7	3,236.6
2012	732.8	188.0	920.8	598.0	3,496.0
2015	786.2	231.4	1,017.6	679.4	4,277.0
2020	878.2	299.5	1,177.8	850.9	5,482.2
2025	977.6	354.4	1,332.0	1,036.5	6,440.3
2030	1,088.7	396.2	1,485.0	1,217.3	7,168.7
2035	1,214.9	429.7	1,644.6	1,378.4	7,762.1
2040	1,355.8	464.5	1,820.2	1,521.6	8,393.7
2045	1,512.3	507.1	2,019.4	1,675.0	9,172.5
2050	1,686.4	557.1	2,243.5	1,860.5	10,079.2
2055	1,881.6	611.5	2,493.0	2,080.3	11,057.7
2060	2,102.1	669.6	2,771.7	2,318.0	12,109.2
2065	2,350.0	736.4	3,086.4	2,571.1	13,324.2
2070	2,627.0	814.4	3,441.4	2,859.1	14,741.5
2075	2,935.0	902.6	3,837.6	3,193.4	16,336.0
2080	3,277.4	997.5	4,274.9	3,581.0	18,043.6

Table VI.F8.—Operations of the Combined OASI and DI Trust Funds, in Constant 2003 Dollars,[1] Calendar Years 2003-80 (Cont.)
[In billions]

Calendar year	Income excluding interest	Interest income	Total income	Cost	Assets at end of year
High Cost:					
2003	$549.7	$86.3	$636.0	$481.2	$1,532.8
2004	551.1	93.0	644.2	491.5	1,640.9
2005	570.8	103.3	674.1	498.3	1,746.5
2006	568.2	113.4	681.6	504.4	1,827.4
2007	571.1	122.1	693.1	519.3	1,901.8
2008	588.4	133.6	722.0	537.5	1,997.7
2009	600.5	140.7	741.2	558.0	2,101.5
2010	610.3	145.4	755.7	576.4	2,200.0
2011	620.0	149.7	769.7	595.5	2,289.6
2012	627.8	153.3	781.0	615.9	2,366.7
2015	652.0	155.6	807.6	681.8	2,509.7
2020	688.3	142.8	831.1	819.1	2,334.2
2025	724.3	98.9	823.2	970.9	1,533.0
2030 [2]	760.3	13.8	774.1	1,113.0	39.3

[1] The adjustment from current to constant dollars is by the adjusted CPI indexing series shown in table VI.F7.

[2] Estimates for later years are not shown because the combined OASI and DI Trust Funds are estimated to become exhausted in 2042 under the intermediate assumptions and in 2031 under the high cost assumptions.

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

Figure VI.F1 provides a comparison of annual cost with total annual income (including interest) and annual income excluding interest, for the OASDI program under intermediate assumptions. All values are expressed in constant dollars, as shown in table VI.F8. The difference between the income values for each year is equal to the trust fund interest earnings. Thus the figure illustrates the fact that, under intermediate assumptions, combined OASDI cost will be payable from (1) current tax income alone through 2017, (2) current tax income plus amounts from the trust funds that are less than annual interest income for years 2018 through 2027, and (3) current tax income plus amounts from the trust funds that are greater than annual interest income for years 2028 through 2041, i.e., through the year preceding the year of trust fund exhaustion.

Figure VI.F1.—Estimated OASDI Income and Cost in Constant Dollars, Based on Intermediate Assumptions
[In billions]

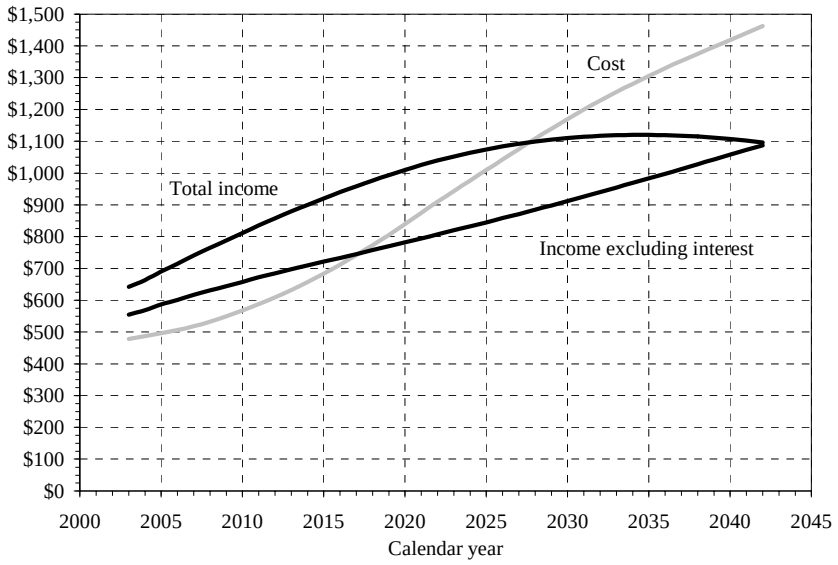


Table VI.F9 shows estimated operations of the combined OASI and DI Trust Funds in current dollars—that is in dollars unadjusted for price inflation. Items included in the table are: income excluding interest, interest income, total income, total cost, and assets at the end of the year. These estimates, based on the low cost, intermediate, and high cost sets of demographic and economic assumptions, are presented to facilitate independent analysis.

Table VI.F9.—Operations of the Combined OASI and DI Trust Funds, in Current Dollars, Calendar Years 2003-80

[In billions]

Calendar year	Income excluding interest	Interest income	Total income	Cost	Assets at end of year
Intermediate:					
2003	$555.0	$87.5	$642.5	$477.9	$1,542.6
2004	582.1	97.3	679.4	498.8	1,723.1
2005	616.9	109.3	726.2	522.4	1,927.0
2006	650.8	122.9	773.7	547.6	2,153.0
2007	687.8	137.9	825.7	577.8	2,400.9
2008	724.1	153.7	877.8	611.8	2,666.9
2009	761.8	170.0	931.8	649.9	2,948.8
2010	800.9	186.9	987.9	691.4	3,245.2
2011	843.2	204.6	1,047.9	736.8	3,556.3
2012	884.6	223.1	1,107.7	786.0	3,878.0
2015	1,018.8	280.6	1,299.4	965.0	4,874.3
2020	1,280.5	372.7	1,653.1	1,374.7	6,417.7
2025	1,603.8	434.2	2,038.1	1,916.0	7,372.9
2030	2,006.4	435.7	2,442.1	2,574.3	7,260.1
2035	2,507.8	349.0	2,856.8	3,330.3	5,610.4
2040[1]	3,126.2	146.9	3,273.1	4,194.7	1,952.8
Low Cost:					
2003	557.4	88.0	645.4	476.2	1,547.1
2004	590.5	98.5	689.0	494.6	1,741.5
2005	623.4	110.0	733.4	514.4	1,960.5
2006	655.5	122.5	778.0	533.8	2,204.6
2007	690.4	136.2	826.6	556.9	2,474.4
2008	725.1	151.2	876.3	582.0	2,768.6
2009	760.8	167.6	928.4	610.8	3,086.2
2010	797.7	185.2	982.9	642.2	3,426.9
2011	837.2	204.3	1,041.6	676.8	3,791.7
2012	875.6	224.6	1,100.3	714.5	4,177.4
2015	996.9	293.5	1,290.3	861.5	5,423.3
2020	1,229.5	419.4	1,648.9	1,191.3	7,675.1
2025	1,511.2	547.8	2,058.9	1,602.1	9,954.9
2030	1,858.0	676.2	2,534.2	2,077.5	12,234.0
2035	2,289.2	809.7	3,098.9	2,597.3	14,625.6
2040	2,820.4	966.2	3,786.7	3,165.4	17,461.7
2045	3,473.6	1,164.7	4,638.3	3,847.3	21,067.8
2050	4,276.6	1,412.8	5,689.4	4,718.0	25,560.1
2055	5,268.1	1,712.0	6,980.1	5,824.6	30,960.0
2060	6,498.0	2,070.0	8,568.0	7,165.6	37,432.7
2065	8,020.5	2,513.4	10,533.8	8,775.3	45,475.5
2070	9,899.1	3,069.0	12,968.1	10,773.7	55,549.6
2075	12,210.9	3,755.2	15,966.1	13,286.0	67,965.0
2080	15,054.5	4,581.9	19,636.4	16,449.2	82,882.5

Table VI.F9.—Operations of the Combined OASI and DI Trust Funds, in Current Dollars, Calendar Years 2003-80 (Cont.)
[In billions]

Calendar year	Income excluding interest	Interest income	Total income	Cost	Assets at end of year
High Cost:					
2003	$549.7	$86.3	$636.0	$481.2	$1,532.8
2004	567.6	95.8	663.5	506.2	1,690.1
2005	614.3	111.1	725.4	536.1	1,879.3
2006	647.1	129.1	776.2	574.4	2,081.1
2007	687.8	147.0	834.8	625.5	2,290.5
2008	743.2	168.8	912.0	679.0	2,523.5
2009	789.9	185.1	975.0	734.0	2,764.5
2010	834.9	198.9	1,033.9	788.5	3,009.8
2011	882.2	212.9	1,095.1	847.3	3,257.6
2012	928.9	226.8	1,155.7	911.3	3,502.0
2015	1,085.2	258.9	1,344.1	1,134.8	4,177.2
2020	1,393.8	289.2	1,682.9	1,658.6	4,726.8
2025	1,784.5	243.7	2,028.2	2,392.1	3,777.0
2030 [1]	2,279.0	41.4	2,320.4	3,336.3	117.9

[1] Estimates for later years are not shown because the combined OASI and DI Trust Funds are estimated to become exhausted in 2042 under the intermediate assumptions and in 2031 under the high cost assumptions.

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

Table VI.F10 shows, in current dollars, estimated income (excluding interest) and estimated total cost (excluding the cost of accumulating target trust fund balances) of the combined OASI and DI Trust Funds, of the HI Trust Fund, and of the combined OASI, DI, and HI Trust Funds, based on the low cost, intermediate, and high cost sets of assumptions described earlier in this report. For OASDI, income excluding interest consists of payroll-tax contributions, proceeds from taxation of OASDI benefits, and miscellaneous transfers from the General Fund of the Treasury. Cost consists of benefit payments, administrative expenses, net transfers from the trust funds to the Railroad Retirement program, and payments for vocational rehabilitation services for disabled beneficiaries. For HI, income excluding interest consists of payroll-tax contributions (including contributions from railroad employment) and proceeds from the taxation of OASDI benefits. Total cost consists of outlays (scheduled benefits and administrative expenses) for insured beneficiaries. Income and cost estimates are shown on a cash basis for the OASDI program and on an incurred basis for the HI program.

Table VI.F10 also shows the difference between income excluding interest and cost, which is called the balance. The balance indicates the size of the difference between tax income and cost.

Table VI.F10.—OASDI and HI Annual Income Excluding Interest, Cost, and Balance in Current Dollars, Calendar Years 2003-80

[In billions]

Calendar year	OASDI			HI			Combined		
	Income excluding interest	Cost	Balance	Income excluding interest	Cost	Balance	Income excluding interest	Cost	Balance
Intermediate:									
2003	$555	$478	$77	$164	$157	$7	$719	$635	$84
2004	582	499	83	174	166	8	756	665	92
2005	617	522	95	185	174	10	802	697	105
2006	651	548	103	195	184	11	846	732	114
2007	688	578	110	207	195	12	895	773	122
2008	724	612	112	219	207	12	943	819	124
2009	762	650	112	231	220	11	993	870	122
2010	801	691	110	243	235	8	1,044	927	118
2011	843	737	106	257	251	6	1,101	988	112
2012	885	786	99	271	268	3	1,156	1,054	101
2015	1,019	965	54	314	328	-14	1,332	1,293	40
2020	1,280	1,375	-94	398	466	-69	1,678	1,841	-163
2025	1,604	1,916	-312	503	673	-170	2,106	2,589	-482
2030	2,006	2,574	-568	633	971	-338	2,639	3,545	-906
2035	2,508	3,330	-823	795	1,377	-583	3,302	4,708	-1,405
2040	3,126	4,195	-1,069	992	1,904	-912	4,118	6,099	-1,981
2045	3,886	5,250	-1,365	1,234	2,577	-1,343	5,120	7,827	-2,707
2050	4,819	6,601	-1,782	1,533	3,439	-1,906	6,353	10,040	-3,688
2055	5,974	8,337	-2,363	1,904	4,576	-2,672	7,879	12,914	-5,035
2060	7,408	10,496	-3,088	2,366	6,114	-3,748	9,774	16,610	-6,836
2065	9,180	13,174	-3,994	2,935	8,191	-5,256	12,115	21,365	-9,250
2070	11,367	16,555	-5,188	3,640	10,999	-7,358	15,007	27,554	-12,546
2075	14,063	20,791	-6,727	4,510	14,701	-10,190	18,574	35,491	-16,917
2080	17,389	26,062	-8,673	5,583	19,648	-14,065	22,972	45,709	-22,738
Low Cost:									
2003	557	476	81	166	154	12	723	630	93
2004	591	495	96	176	160	16	767	655	112
2005	623	514	109	186	165	21	809	679	130
2006	655	534	122	196	170	26	851	704	147
2007	690	557	134	206	176	31	897	733	164
2008	725	582	143	217	182	35	942	764	178
2009	761	611	150	229	190	39	989	801	189
2010	798	642	155	240	199	42	1,038	841	197
2011	837	677	160	253	208	45	1,090	885	206
2012	876	715	161	265	217	48	1,141	932	209
2015	997	861	135	303	248	55	1,300	1,109	190
2020	1,230	1,191	38	377	315	61	1,606	1,507	99
2025	1,511	1,602	-91	466	407	59	1,977	2,009	-32
2030	1,858	2,078	-219	576	525	51	2,434	2,603	-169
2035	2,289	2,597	-308	712	679	33	3,001	3,276	-275
2040	2,820	3,165	-345	877	875	1	3,697	4,041	-344
2045	3,474	3,847	-374	1,079	1,131	-52	4,553	4,978	-425
2050	4,277	4,718	-441	1,328	1,474	-146	5,605	6,192	-587
2055	5,268	5,825	-557	1,637	1,950	-312	6,905	7,774	-869
2060	6,498	7,166	-668	2,020	2,594	-574	8,518	9,760	-1,242
2065	8,020	8,775	-755	2,492	3,467	-975	10,512	12,242	-1,729
2070	9,899	10,774	-875	3,075	4,646	-1,571	12,974	15,419	-2,446
2075	12,211	13,286	-1,075	3,792	6,198	-2,406	16,003	19,484	-3,481
2080	15,054	16,449	-1,395	4,676	8,277	-3,601	19,731	24,726	-4,996

Table VI.F10.—OASDI and HI Annual Income Excluding Interest, Cost, and Balance in Current Dollars, Calendar Years 2003-80 (Cont.)
[In billions]

Calendar year	OASDI			HI			Combined		
	Income excluding interest	Cost	Balance	Income excluding interest	Cost	Balance	Income excluding interest	Cost	Balance
High Cost:									
2003	$550	$481	$69	$161	$161	1/	$711	$642	$69
2004	568	506	61	172	174	-$1	740	680	60
2005	614	536	78	185	187	-2	799	723	76
2006	647	574	73	196	202	-7	843	777	66
2007	688	625	62	209	220	-11	897	846	51
2008	743	679	64	228	243	-16	971	922	49
2009	790	734	56	242	267	-24	1,032	1,001	32
2010	835	789	46	256	291	-35	1,091	1,080	12
2011	882	847	35	272	318	-46	1,154	1,165	-11
2012	929	911	18	288	348	-60	1,217	1,259	-42
2015	1,085	1,135	-50	339	454	-116	1,424	1,589	-166
2020	1,394	1,659	-265	439	726	-286	1,833	2,384	-551
2025	1,784	2,392	-608	568	1,176	-607	2,353	3,568	-1,215
2030	2,279	3,336	-1,057	732	1,901	-1,169	3,011	5,238	-2,227
2035	2,899	4,483	-1,584	937	2,967	-2,029	3,836	7,449	-3,613
2040	3,668	5,865	-2,198	1,190	4,404	-3,214	4,858	10,270	-5,412
2045	4,612	7,603	-2,991	1,501	6,250	-4,749	6,113	13,854	-7,740
2050	5,776	9,857	-4,081	1,887	8,550	-6,663	7,663	18,407	-10,744
2055	7,217	12,797	-5,580	2,368	11,454	-9,086	9,585	24,251	-14,666
2060	9,009	16,547	-7,539	2,969	15,368	-12,400	11,978	31,916	-19,938
2065	11,219	21,345	-10,126	3,713	20,638	-16,925	14,932	41,983	-27,051
2070	13,948	27,513	-13,565	4,636	27,750	-23,114	18,584	55,263	-36,680
2075	17,315	35,305	-17,991	5,778	37,122	-31,345	23,093	72,428	-49,336
2080	21,477	45,021	-23,544	7,192	49,635	-42,442	28,669	94,655	-65,986

[1] Less than $500 million.

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

Table VI.F11 shows projected future benefit amounts payable upon retirement at either the normal retirement age (NRA) or age 65, for workers attaining age 65 in 2003 and subsequent years. Illustrative benefit levels are shown for workers with four separate pre-retirement earnings patterns. All estimates are based on the intermediate assumptions in this report. The benefit amounts are shown in constant 2003 dollars (adjusted to 2003 levels by the CPI indexing series shown in table VI.F7). Benefit amounts are also shown as percentages of the general, career-average relative earnings level for each case, wage indexed to the year prior to retirement. These percentages thus represent the benefit "replacement rate" of the career-average level of earnings.

The normal retirement age is 65 for individuals who reached age 62 before 2000 and is scheduled to increase to age 66 during the period 2000-05 (at a rate of 2 months per year as workers attain age 62) and to age 67 during the period 2017-22 (also by 2 months per year as workers attain age 62). Thus, for illustrative cases attaining age 65 after 2002, benefit levels shown for

retirement at 65 are lower than the levels shown for retirement at NRA, primarily because of the actuarial reduction for "early" (pre-NRA) retirement.

Four different pre-retirement earnings patterns are represented in table VI.F11. Three of these patterns are for workers with scaled-earnings patterns,[1] reflecting low, medium, and high career-average levels of pre-retirement earnings starting at age 21. The fourth case is the steady maximum earner. The three scaled-earnings cases have earnings patterns that reflect differences by age in the probability of work and in average earnings levels experienced by insured workers during the period 1990-99. The general, career-average level of earnings for the scaled cases is set relative to the SSA average wage indexing series (AWI) so that benefit levels are consistent with levels for "steady-earnings" cases that were shown in the 2000 and earlier Trustees Reports. For the scaled medium earner, the general, career-average earnings level is about equal to the AWI. For the scaled low and high earners, the general, career-average earnings level is set at about 45 percent and 160 percent of the AWI, respectively. The steady maximum earner is assumed to have earnings at (or above) the OASDI contribution and benefit base for each year prior to retirement starting at age 22.

As noted above, the scaled-earnings cases were constructed so that their career-average earnings levels are consistent with the corresponding steady low, average, and high earners that were illustrated in the 2000 Trustees Report. As a result, values in this table for benefits under the present-law Social Security benefit formula are essentially comparable to those in earlier reports. Scaled-earnings cases are now generally being used instead of steady-earnings cases because they more accurately illustrate the differences in benefit levels under the wide variety of reform proposals considered in recent years.

[1] More details are provided on the development of scaled-earnings patterns in the Social Security Administration Actuarial Note Number 144, located at the following internet address: http://www.ssa.gov/OACT/NOTES/note144.html.

Table VI.F11.—Estimated Annual Scheduled Benefit Amounts[1] for Retired Workers With Various Pre-Retirement Earnings Patterns Based on Intermediate Assumptions, Calendar Years 2003-80

	Retirement at normal retirement age			Retirement at age 65		
Year attain age 65[2]	Age at retirement	Constant 2003 dollars[3]	Percent of earnings	Age at retirement	Constant 2003 dollars[3]	Percent of earnings
Scaled low earnings:[4]						
2003	65:2	$8,475	56.1	65:0	$8,380	55.6
2005	65:6	8,852	56.8	65:0	8,557	55.2
2010	66:0	9,244	55.5	65:0	8,622	52.4
2015	66:0	9,801	55.9	65:0	9,142	52.6
2020	66:2	10,331	55.9	65:0	9,525	52.1
2025	67:0	10,863	55.3	65:0	9,414	48.9
2030	67:0	11,448	55.3	65:0	9,920	48.9
2035	67:0	12,068	55.2	65:0	10,458	48.9
2040	67:0	12,745	55.2	65:0	11,047	48.9
2045	67:0	13,459	55.2	65:0	11,664	48.9
2050	67:0	14,210	55.3	65:0	12,314	48.9
2055	67:0	14,987	55.3	65:0	12,988	48.9
2060	67:0	15,804	55.3	65:0	13,695	48.9
2065	67:0	16,668	55.2	65:0	14,445	48.9
2070	67:0	17,584	55.3	65:0	15,238	48.9
2075	67:0	18,548	55.3	65:0	16,076	48.9
2080	67:0	19,563	55.3	65:0	16,954	48.9
Scaled medium earnings:[5]						
2003	65:2	13,970	41.6	65:0	13,814	41.3
2005	65:6	14,579	42.1	65:0	14,104	41.0
2010	66:0	15,228	41.2	65:0	14,213	38.8
2015	66:0	16,146	41.4	65:0	15,071	39.0
2020	66:2	17,024	41.4	65:0	15,698	38.7
2025	67:0	17,902	41.0	65:0	15,513	36.3
2030	67:0	18,860	41.0	65:0	16,345	36.3
2035	67:0	19,884	40.9	65:0	17,236	36.2
2040	67:0	20,999	40.9	65:0	18,201	36.2
2045	67:0	22,173	40.9	65:0	19,217	36.2
2050	67:0	23,408	41.0	65:0	20,289	36.3
2055	67:0	24,692	41.0	65:0	21,398	36.3
2060	67:0	26,035	41.0	65:0	22,563	36.3
2065	67:0	27,461	41.0	65:0	23,799	36.3
2070	67:0	28,969	41.0	65:0	25,105	36.3
2075	67:0	30,558	41.0	65:0	26,483	36.3
2080	67:0	32,228	41.0	65:0	27,931	36.3
Scaled high earnings:[6]						
2003	65:2	18,357	35.1	65:0	18,154	34.8
2005	65:6	19,230	35.2	65:0	18,601	34.3
2010	66:0	20,185	34.1	65:0	18,845	32.2
2015	66:0	21,414	34.3	65:0	19,987	32.4
2020	66:2	22,569	34.3	65:0	20,813	32.0
2025	67:0	23,735	34.0	65:0	20,571	30.1
2030	67:0	25,009	34.0	65:0	21,671	30.1
2035	67:0	26,362	33.9	65:0	22,850	30.0
2040	67:0	27,842	33.9	65:0	24,129	30.0
2045	67:0	29,399	33.9	65:0	25,479	30.0
2050	67:0	31,034	33.9	65:0	26,895	30.0
2055	67:0	32,735	34.0	65:0	28,369	30.1
2060	67:0	34,517	33.9	65:0	29,914	30.1
2065	67:0	36,408	33.9	65:0	31,553	30.1
2070	67:0	38,404	33.9	65:0	33,283	30.0
2075	67:0	40,513	33.9	65:0	35,110	30.1
2080	67:0	42,725	34.0	65:0	37,029	30.1

Table VI.F11.—Estimated Annual Scheduled Benefit Amounts[1] for Retired Workers With Various Pre-Retirement Earnings Patterns Based on Intermediate Assumptions, Calendar Years 2003-80 (Cont.)

	Retirement at normal retirement age			Retirement at age 65		
Year attain age 65[2]	Age at retirement	Constant 2003 dollars[3]	Percent of earnings	Age at retirement	Constant 2003 dollars[3]	Percent of earnings
Steady maximum earnings:[7]						
2003	65:2	$20,929	29.8	65:0	$20,692	29.6
2005	65:6	22,145	29.4	65:0	21,415	28.8
2010	66:0	24,088	28.0	65:0	22,292	26.5
2015	66:0	26,022	27.7	65:0	24,162	26.1
2020	66:2	27,557	27.6	65:0	25,317	25.6
2025	67:0	29,166	27.3	65:0	25,079	24.0
2030	67:0	30,752	27.3	65:0	26,456	24.0
2035	67:0	32,422	27.2	65:0	27,897	23.9
2040	67:0	34,197	27.3	65:0	29,427	24.0
2045	67:0	36,109	27.3	65:0	31,070	24.0
2050	67:0	38,080	27.3	65:0	32,766	24.0
2055	67:0	40,165	27.3	65:0	34,561	24.0
2060	67:0	42,349	27.3	65:0	36,443	24.0
2065	67:0	44,665	27.3	65:0	38,434	24.0
2070	67:0	47,114	27.3	65:0	40,542	24.0
2075	67:0	49,697	27.3	65:0	42,764	24.0
2080	67:0	52,414	27.3	65:0	45,103	24.0

[1] Annual scheduled benefit amounts are the total for the 12-month period starting with the month of retirement.
[2] Assumed to attain age 65 in January of the year.
[3] The adjustment for constant dollars is made using the adjusted CPI indexing series shown in table VI.F7.
[4] Career-average earnings at about 45 percent of the SSA average wage index (AWI).
[5] Career-average earnings at about 100 percent of the AWI.
[6] Career-average earnings at about 160 percent of the AWI.
[7] Earnings for each year equal to the OASDI contribution and benefit base.

G. ANALYSIS OF BENEFIT DISBURSEMENTS FROM THE OASI TRUST FUND WITH RESPECT TO DISABLED BENEFICIARIES

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

Effective January 1957, monthly benefits have been payable from the OASI Trust Fund to disabled children aged 18 and over of retired and deceased workers in those cases for which the disability began before age 18. The age before which disability is required to have begun was subsequently changed to age 22. Effective February 1968, reduced monthly benefits have been payable from this trust fund to disabled widows and widowers at ages 50 and over. Effective January 1991, the requirements for the disability of the widow or widower were made less restrictive.

On December 31, 2002, about 824,000 persons were receiving monthly benefits from the OASI Trust Fund because of their disabilities or the disabilities of children. This total includes 33,000 mothers and fathers (wives or husbands under age 65 of retired-worker beneficiaries and widows or widowers of deceased insured workers) who met all other qualifying requirements and were receiving unreduced benefits solely because they had disabled-child beneficiaries (or disabled children aged 16 or 17) in their care. Benefits paid from this trust fund to the persons described above totaled $5,746 million in calendar year 2002. Table VI.G1 shows these and similar figures for selected calendar years during 1960-2002, and estimated experience for 2003-12 based on the intermediate set of assumptions.

Table VI.G1.—Benefit Disbursements From the OASI Trust Fund With Respect to Disabled Beneficiaries

[Beneficiaries in thousands; benefit payments in millions]

Calendar year	Disabled beneficiaries, end of year			Amount of benefit payments[1]		
	Total	Children[2]	Widows-widowers[3]	Total	Children[2]	Widows-widowers[4]
Historical data:						
1960	117	117	—	$59	$59	—
1965	214	214	—	134	134	—
1970	316	281	36	301	260	$41
1975	435	376	58	664	560	104
1980	519	460	59	1,223	1,097	126
1985	594	547	47	2,072	1,885	187
1986	614	565	49	2,219	2,022	197
1987	629	580	49	2,331	2,128	203
1988	640	591	49	2,518	2,307	211
1989	651	602	49	2,680	2,459	221
1990	662	613	49	2,882	2,649	233
1991	687	627	61	3,179	2,875	304
1992	715	643	72	3,459	3,079	380
1993	740	659	81	3,752	3,296	456
1994	758	671	86	3,973	3,481	492
1995	772	681	91	4,202	3,672	531
1996	782	687	94	4,410	3,846	565
1997	789	693	96	4,646	4,050	596
1998	797	698	99	4,838	4,210	627
1999	805	702	102	4,991	4,336	655
2000	811	707	104	5,194	4,514	680
2001	817	712	105	5,500	4,782	718
2002	824	718	106	5,746	4,997	749
Estimates:						
2003	832	727	106	5,920	5,154	767
2004	841	735	106	6,167	5,375	792
2005	849	743	106	6,428	5,606	822
2006	855	750	105	6,712	5,869	843
2007	860	757	103	7,003	6,145	858
2008	864	764	101	7,311	6,435	876
2009	868	770	99	7,632	6,739	893
2010	872	775	96	7,964	7,053	911
2011	875	780	94	8,322	7,380	942
2012	877	785	92	8,678	7,712	966

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

[2] Also includes certain mothers and fathers (see text).

[3] In 1984 and later years, only disabled widows and widowers aged 50-59 are included because disabled widows and widowers aged 60-64 would be eligible for the same benefit as a nondisabled aged widow or widower; therefore, they are not receiving benefits solely because of a disability.

[4] In 1983 and prior years, reflects the offsetting effect of lower benefits payable to disabled widows and widowers who continued to receive benefits after attaining age 60 (62, for disabled widowers, prior to 1973) as compared to the higher nondisabled widow's and widower's benefits that would otherwise be payable. In 1984 and later years, only benefit payments to disabled widows and widowers aged 50-59 are included (see footnote 3).

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

Total benefit payments from the OASI Trust Fund with respect to disabled beneficiaries are estimated to increase from $5,920 million in calendar year 2003 to $8,678 million in calendar year 2012, based on the intermediate assumptions.

In calendar year 2002, benefit payments (including expenditures for vocational rehabilitation services) with respect to disabled persons from the OASI Trust Fund and from the DI Trust Fund (including payments from the latter fund to all children and spouses of disabled-worker beneficiaries) totaled $71,481 million. Of this amount, $5,746 million or 8.0 percent represented payments from the OASI Trust Fund. These and similar figures for selected calendar years during 1960-2002 and estimates for calendar years 2003-12 are presented in table VI.G2.

Table VI.G2.—Benefit Disbursements Under the OASDI Program With Respect to Disabled Beneficiaries
[Amounts in millions]

Calendar year	Total [1]	DI Trust Fund [2]	OASI Trust Fund	
			Amount [3]	Percentage of total
Historical data:				
1960	$627	$568	$59	9.4
1965	1,707	1,573	134	7.9
1970	3,386	3,085	301	8.9
1975	9,169	8,505	664	7.2
1980	16,738	15,515	1,223	7.3
1985	20,908	18,836	2,072	9.9
1986	22,075	19,856	2,219	10.1
1987	22,858	20,527	2,331	10.2
1988	24,226	21,708	2,518	10.4
1989	25,591	22,911	2,680	10.5
1990	27,717	24,835	2,882	10.4
1991	30,877	27,698	3,179	10.3
1992	34,583	31,124	3,459	10.0
1993	38,378	34,626	3,752	9.8
1994	41,730	37,757	3,973	9.5
1995	45,140	40,937	4,202	9.3
1996	48,615	44,205	4,410	9.1
1997	50,358	45,712	4,646	9.2
1998	53,062	48,224	4,838	9.1
1999	56,390	51,399	4,991	8.9
2000	60,195	55,001	5,194	8.6
2001	65,137	59,637	5,500	8.4
2002	71,481	65,736	5,746	8.0
Estimates:				
2003	77,118	71,198	5,920	7.7
2004	83,978	77,811	6,167	7.3
2005	90,439	84,011	6,428	7.1
2006	95,534	88,822	6,712	7.0
2007	101,902	94,899	7,003	6.9
2008	108,763	101,452	7,311	6.7
2009	116,772	109,141	7,632	6.5
2010	124,561	116,597	7,964	6.4
2011	132,738	124,416	8,322	6.3
2012	141,016	132,338	8,678	6.2

[1] Beginning in 1966, includes payments for vocational rehabilitation services.
[2] Benefit payments to disabled workers and their children and spouses.
[3] Benefit payments to disabled children aged 18 and over, to certain mothers and fathers (see text), and to disabled widows and widowers (see footnote 4, table VI.G1).

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

H. GLOSSARY

Actuarial balance. The difference between the summarized income rate and the summarized cost rate over a given valuation period.

Actuarial deficit. A negative actuarial balance.

Administrative expenses. Expenses incurred by the Social Security Administration and the Department of the Treasury in administering the OASDI program and the provisions of the Internal Revenue Code relating to the collection of contributions. Such administrative expenses are paid from the OASI and DI Trust Funds.

Advance tax transfers. Amounts representing the estimated total OASDI tax contributions for a given month. From May 1983 through November 1990, such amounts were credited to the OASI and DI Trust Funds at the beginning of each month. Reimbursements were made from the trust funds to the General Fund of the Treasury for the associated loss of interest. Advance tax transfers are no longer made unless needed in order to pay benefits.

Alternatives I, II, or III. See "Assumptions."

Annual balance. The difference between the income rate and the cost rate in a given year.

Assets. Treasury notes and bonds, other securities guaranteed by the Federal Government, certain Federally sponsored agency obligations, and cash, held by the trust funds for investment purposes.

Assumptions. Values relating to future trends in certain key factors which affect the balance in the trust funds. Demographic assumptions include fertility, mortality, net immigration, marriage, and divorce. Economic assumptions include unemployment rates, average earnings, inflation, interest rates, and productivity. Program-specific assumptions include retirement patterns, and disability incidence and termination rates. Three sets of demographic, economic, and program-specific assumptions are presented in this report—

- Alternative II is the intermediate set of assumptions, and represents the Trustees' best estimates of likely future demographic, economic, and program-specific conditions.
- Alternative I is characterized as a low cost set—it assumes relatively rapid economic growth, low inflation, and favorable (from the standpoint of program financing) demographic conditions.
- Alternative III is characterized as a high cost set—it assumes relatively slow economic growth, high inflation, and unfavorable (from the standpoint of program financing) demographic conditions.

See tables V.A1, V.B1, and V.B2.

Automatic cost-of-living benefit increase. The annual increase in benefits, effective for December, reflecting the increase in the cost of living. The benefit increase equals the percentage increase in the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) measured from the average over July, August, and September of the preceding year to the average for the same 3 months in the current year. If the increase is less than one-tenth of 1 percent, when rounded, there is no automatic increase for the current year; the increase for the next year would reflect the net increase in the CPI over a 2-year period. See table V.C1.

Auxiliary benefits. Monthly benefits payable to a spouse or child of a retired or disabled worker, or to a survivor of a deceased worker.

Average indexed monthly earnings—AIME. The amount of earnings used in determining the primary insurance amount (PIA) for most workers who attain age 62, become disabled, or die after 1978. A worker's actual past earnings are adjusted by changes in the average wage index, in order to bring them up to their approximately equivalent value at the time of retirement or other eligibility for benefits.

Average wage index. The average amount of total wages for each year after 1950, including wages in noncovered employment and wages in covered employment in excess of the OASDI contribution and benefit base. (See Title 20, Chapter III, section 404.211(c) of the Code of Federal Regulations for a more precise definition.) These average wage amounts are used to index the taxable earnings of most workers first becoming eligible for benefits in 1979 or later, and for automatic adjustments in the contribution and benefit base, bend points, earnings test exempt amounts, and other wage-indexed amounts. See table V.C1.

Award. An administrative determination that an individual is entitled to receive a specified type of OASDI benefit. Awards can represent not only new entrants to the benefit rolls but also persons already on the rolls who become entitled to a different type of benefit. Awards usually result in the immediate payment of benefits, although payments may be deferred or withheld depending on the individual's particular circumstances.

Baby boom. The period from the end of World War II through the mid-1960s marked by unusually high birth rates.

Bend points. The dollar amounts defining the AIME or PIA brackets in the benefit formulas. For the bend points for years 1979 and later, see table V.C2.

Beneficiary. A person who has been awarded benefits on the basis of his or her own or another's earnings record. The benefits may be either in current-payment status or withheld.

Benefit award. See "Award."

Benefit payments. The amounts disbursed for OASI and DI benefits by the Department of the Treasury in specified periods.

Benefit termination. See "Termination."

Best estimate assumptions. See "Assumptions."

Board of Trustees. A Board established by the Social Security Act to oversee the financial operations of the Federal Old-Age and Survivors Insurance Trust Fund and the Federal Disability Insurance Trust Fund. The Board is composed of six members, four of whom serve automatically by virtue of their positions in the Federal Government: the Secretary of the Treasury, who is the Managing Trustee, the Secretary of Labor, the Secretary of Health and Human Services, and the Commissioner of Social Security. The other two members are appointed by the President and confirmed by the Senate to serve as public representatives.

Book value. A bond's value between its price at purchase and its value at maturity. Book value is calculated as par value plus unamortized premium, if purchased at a price above its par value, or less unamortized discount, if purchased below par.

Constant dollars. Amounts adjusted by the CPI to the value of the dollar in a particular year.

Consumer Price Index—CPI. An official measure of inflation in consumer prices. In this report, all references to the CPI relate to the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W). See table V.B1.

Contribution and benefit base. Annual dollar amount above which earnings in employment covered under the OASDI program are neither taxable nor creditable for benefit computation purposes. (Also referred to as maximum contribution and benefit base, annual creditable maximum, taxable maximum, and maximum taxable.) See tables V.C1 and VI.A1. See "HI contribution base."

Contributions. The amount based on a percent of earnings, up to an annual maximum, that must be paid by—

- employers and employees on wages from employment under the Federal Insurance Contributions Act,
- the self-employed on net earnings from self-employment under the Self-Employment Contributions Act, and
- States on the wages of State and local government employees covered under the Social Security Act through voluntary agreements under section 218 of the Act.

Generally, employers withhold contributions from wages, add an equal amount of contributions, and pay both on a current basis. Also referred to as taxes.

Cost-of-living adjustment. See "Automatic cost-of-living benefit increase."

Cost rate. The cost rate for a year is the ratio of the cost of the program to the taxable payroll for the year. In this context, the cost is defined to include scheduled benefit payments, special monthly payments to certain uninsured persons who have 3 or more quarters of coverage (and whose payments are therefore not reimbursable from the General Fund of the Treasury), administrative expenses, net transfers from the trust funds to the Railroad Retirement program under the financial-interchange provisions, and payments for vocational rehabilitation services for disabled beneficiaries; it excludes special monthly payments to certain uninsured persons whose payments are reimbursable from the General Fund of the Treasury (as described above), and transfers under the interfund borrowing provisions.

Covered earnings. Earnings in employment covered by the OASDI program.

Covered employment. All employment for which earnings are creditable for Social Security purposes. Almost all employment is covered under the program. Some exceptions are:

- State and local government employees whose employer has not elected to be covered under Social Security and who are participating in a employer-provided pension plan.
- Current Federal civilian workers hired before 1984 who have not elected to be covered.
- Self-employed workers earning less than $400 in a calendar year.

Covered worker. A person who has earnings creditable for Social Security purposes on the basis of services for wages in covered employment and/or on the basis of income from covered self-employment.

Creditable earnings. Wage or self-employment earnings posted to a worker's earnings record, upon which eligibility for and amount of benefits on that worker's record is based. The maximum amount of creditable earnings for each worker in a calendar year is determined by the contribution and benefit base.

Current-cost financing. See "Pay-as-you-go financing."

Current dollars. Amounts expressed in nominal dollars with no adjustment for inflationary changes in the value of the dollar over time.

Current-payment status. Status of a beneficiary to whom a benefit is being paid for a given month (with or without deductions, provided the deductions add to less than a full month's benefit).

Deemed wage credit. See "Military service wage credits."

Delayed Retirement Credit. Increases the benefit amount for certain individuals who did not receive benefits for months after attainment of the normal retirement age but before age 70. Delayed retirement credit increases apply for benefits beginning January of the year following the year the individual attains the normal retirement age. See table V.C3.

Demographic assumptions. See "Assumptions."

Deterministic model. A model with specified assumptions for and relationships among variables. Under such a model, any specified set of assumptions determines a single outcome directly reflecting the specifications.

Disability. For Social Security purposes, the inability to engage in substantial gainful activity (see "Substantial gainful activity—SGA") by reason of any medically determinable physical or mental impairment that can be expected to result in death or to last for a continuous period of not less than 12 months. Special rules apply for workers at ages 55 and over whose disability is based on blindness.

The law generally requires that a person be disabled continuously for 5 months before he or she can qualify for a disabled-worker benefit.

Disability incidence rate. The proportion of workers in a given year, insured for but not receiving disability benefits, who apply for and are awarded disability benefits.

Disability Insurance (DI) Trust Fund. See "Trust fund."

Disability termination rate. The proportion of disabled-worker beneficiaries in a given year whose disability benefits terminate as a result of the individual's recovery, death, or attainment of normal retirement age.

Disabled-worker benefit. A monthly benefit payable to a disabled worker under normal retirement age and insured for disability. Before November 1960, disability benefits were limited to disabled workers aged 50-64.

Disbursements. Actual expenditures (outgo) made or expected to be made under current law, including benefits paid or payable, special monthly payments to certain uninsured persons who have 3 or more quarters of coverage (and whose payments are therefore not reimbursable from the General Fund of the Treasury), administrative expenses, net transfers from the trust funds to the Railroad Retirement program under the financial-interchange provisions, and payments for vocational rehabilitation services for disabled beneficiaries; it excludes special monthly payments to certain uninsured persons whose payments are reimbursable from the General Fund of the Treasury (as described above), and transfers under the interfund borrowing provisions.

Earnings. Unless otherwise qualified, all wages from employment and net earnings from self-employment, whether or not taxable or covered.

Earnings test. The provision requiring the withholding of benefits if beneficiaries under normal retirement age have earnings in excess of certain exempt amounts. See table V.C1.

Economic assumptions. See "Assumptions."

Effective interest rate. See "Interest rate."

Excess wages. Wages in excess of the contribution and benefit base on which a worker initially pays taxes (usually as a result of working for more than one employer during a year). Employee taxes on excess wages are refundable to affected employees, while the employer taxes are not refundable.

Expenditures. See "Disbursements."

Federal Insurance Contributions Act—FICA. Provision authorizing taxes on the wages of employed persons to provide for Retirement, Survivors, and Disability Insurance, and for Hospital Insurance. The tax is paid in equal amounts by workers and their employers.

Financial interchange. Provisions of the Railroad Retirement Act providing for transfers between the trust funds and the Social Security Equivalent Benefit Account of the Railroad Retirement program in order to place each trust fund in the same position it would have been in if railroad employment had always been covered under Social Security.

Fiscal year. The accounting year of the United States Government. Since 1976, a fiscal year is the 12-month period ending September 30. For example, fiscal year 2003 began October 1, 2002 and will end September 30, 2003.

Full advance funding. A financing scheme where taxes or contributions are established to match the full cost of future benefits as these costs are incurred through current service. Such financing methods also provide for amortization over a fixed period of any financial liability that is incurred at the beginning of the program (or subsequent modification) as a result of granting credit for past service.

General Fund of the Treasury. Funds held by the Treasury of the United States, other than receipts collected for a specific purpose (such as Social Security) and maintained in a separate account for that purpose.

General fund reimbursements. Transfers from the General Fund of the Treasury to the trust funds for specific purposes defined in the law, such as:

- The costs associated with providing special payments made to uninsured persons who attained age 72 before 1968, and who had fewer than 3 quarters of coverage.
- Payments corresponding to the employee-employer taxes on deemed wage credits for military personnel.

- Interest on checks which are not negotiated 6 months after the month of issue. (For checks issued before October, 1989, the principal was returned to the trust funds as a general fund reimbursement; since that time, the principal amount is automatically returned to the issuing fund when the check is uncashed after a year.)
- Administrative expenses incurred as a result of furnishing information on deferred vested benefits to pension plan participants, as required by the Employee Retirement Income Security Act of 1974 (Public Law 93-406).

Gross domestic product—GDP. The total dollar value of all goods and services produced by labor and property located in the United States, regardless of who supplies the labor or property.

HI contribution base. Annual dollar amount above which earnings in employment covered under the HI program are not taxable. (Also referred to as maximum contribution base, taxable maximum, and maximum taxable.) Beginning in 1994, the HI contribution base was eliminated.

High cost assumptions. See "Assumptions."

Hospital Insurance (HI) Trust Fund. See "Trust fund."

Income rate. Ratio of income from tax revenues on a liability basis (payroll-tax contributions and income from the taxation of scheduled benefits) to the OASDI taxable payroll for the year.

Inflation. An increase in the volume of money and credit relative to available goods, resulting in an increase in the general price level.

Insured status. The state or condition of having sufficient quarters of coverage to meet the eligibility requirements for retired-worker or disabled-worker benefits, or to permit the worker's spouse and children or survivors to establish eligibility for benefits in the event of his or her disability, retirement, or death. See "Quarters of coverage."

Interest. A payment in exchange for the use of money during a specified period.

Interest rate. Interest rates on new public-debt obligations issuable to Federal trust funds (see "Special public-debt obligation") are determined monthly. Such rates are set equal to the average market yield on all outstanding marketable U.S. securities not due to mature for at least 4 years from the date of the determination. See table V.B2 for historical and assumed future interest rates on new special-issue securities. The effective interest rate for a trust fund is the ratio of the interest earned by the fund over a given period of time to the average level of assets held by the fund during the period. The effective rate of interest thus represents a measure of the overall average interest earnings on the fund's portfolio of assets.

Interfund borrowing. The borrowing of assets by a trust fund (OASI, DI, or HI) from another of the trust funds when the first fund is in danger of exhaustion. Interfund borrowing was permitted by the Social Security Act only during 1982 through 1987; all amounts borrowed were to be repaid prior to the end of 1989. The only exercise of this authority occurred in 1982, when the OASI Trust Fund borrowed assets from the DI and HI Trust Funds. The final repayment of borrowed amounts occurred in 1986.

Intermediate assumptions. See "Assumptions."

Long range. The next 75 years. Long-range actuarial estimates are made for this period because it is approximately the maximum remaining lifetime of current Social Security participants.

Low cost assumptions. See "Assumptions."

Lump-sum death benefit. A lump sum, generally $255, payable on the death of a fully or currently insured worker. The lump sum is payable to the surviving spouse of the worker, under most circumstances, or to the worker's children.

Maximum family benefit. The maximum monthly amount that can be paid on a worker's earnings record. Whenever the total of the individual monthly benefits payable to all the beneficiaries entitled on one earnings record exceeds the maximum, each dependent's or survivor's benefit is proportionately reduced to bring the total within the maximum. Benefits payable to divorced spouses or surviving divorced spouses are not reduced under the family maximum provision.

Medicare. A nationwide, Federally administered health insurance program authorized in 1965 to cover the cost of hospitalization, medical care, and some related services for most people over age 65, people receiving Social Security Disability Insurance payments for 2 years, and people with End-Stage Renal Disease. Medicare consists of two separate but coordinated programs—Part A (Hospital Insurance, HI) and Part B (Supplementary Medical Insurance, SMI). All persons entitled to HI are eligible to enroll in the SMI program on a voluntary basis by paying a monthly premium. Health insurance protection is available to Medicare beneficiaries without regard to income.

Military service wage credits. Credits recognizing that military personnel receive wages in kind (such as food and shelter) in addition to their basic pay and other cash payments. Noncontributory wage credits of $160 were provided for each month of active military service from September 16, 1940, through December 31, 1956. For years after 1956, the basic pay of military personnel is covered under the Social Security program on a contributory basis. In addition to the contributory credits for basic pay, noncontributory wage credits of $300 were granted for each calendar quarter, from January 1957 through December 1977, in which a person received pay for military

service. Noncontributory wage credits of $100 were granted for each $300 of military wages, up to a maximum credit of $1,200 per calendar year, from January 1978 through December 2001.

National average wage index. See "Average wage index."

Normal retirement age. The age at which a person may first become entitled to unreduced retirement benefits. For persons reaching age 62 before 2000, the normal retirement age is 65. It will increase gradually to 67 for persons reaching that age in 2027 or later, beginning with an increase to 65 years and 2 months for persons reaching age 65 in 2003. See table V.C3.

Old-Age and Survivors Insurance (OASI) Trust Fund. See "Trust fund."

Old-law base. Amount the contribution and benefit base would have been if the discretionary increases in the base under the 1977 amendments had not been enacted. The Social Security Amendments of 1972 provided for automatic annual indexing of the contribution and benefit base. The Social Security Amendments of 1977 provided ad hoc increases to the bases for 1979-81, with subsequent bases updated in accordance with the normal indexing procedure. See table V.C2.

Outgo. See "Disbursements."

Par value. The value printed on the face of a bond. For both public and special issues held by the trust funds, par value is also the redemption value at maturity.

Partial advance funding. A financing scheme where taxes are scheduled to provide a substantial accumulation of trust fund assets, thereby generating additional interest income to the trust funds and reducing the need for payroll tax increases in periods when costs are relatively high. (Higher general taxes or additional borrowing may be required, however, to support the payment of such interest.) While substantial, the trust fund buildup under partial advance funding is much smaller than it would be with full advance funding.

Pay-as-you-go financing. A financing scheme where taxes are scheduled to produce just as much income as required to pay current benefits, with trust fund assets built up only to the extent needed to prevent exhaustion of the fund by random economic fluctuations.

Payment cycling. Beneficiaries on the rolls before May 1, 1997, are paid on the third of the month. Persons applying for OASDI benefits after April 1997, however, generally are paid on the second, third, or fourth Wednesday of the month following the month for which payment is due. The particular Wednesday payment date is based on the wage earner's date of birth. For those born on the first through tenth, the benefit payment day is the second Wednesday of the month; for those born on the eleventh through the twentieth, the benefit payment day is the third Wednesday of the month; and for

those born after the twentieth of the month, the payment day is the fourth Wednesday of the month.

Payroll taxes. A tax levied on the gross wages of workers. See tables VI.A1 and VI.F1.

Population in the Social Security area. The population comprised of (i) residents of the 50 States and the District of Columbia (adjusted for net census undercount); (ii) civilian residents of Puerto Rico, the Virgin Islands, Guam, American Samoa and the Northern Mariana Islands; (iii) Federal civilian employees and persons in the U.S. Armed Forces abroad and their dependents; (iv) crew members of merchant vessels; and (v) all other U.S. citizens abroad.

Present value. The equivalent value, at the present time, of a future stream of payments (either income or cost). The present value of a future stream of payments may be thought of as the lump-sum amount that, if invested today, together with interest earnings would be just enough to meet each of the payments as they fell due. Present values are widely used in calculations involving financial transactions over long periods of time to account for the time value of money (interest). For the purpose of present-value calculations for this report, values are discounted by the effective yield on trust fund assets.

Primary insurance amount—PIA. The monthly amount payable to a retired worker who begins to receive benefits at normal retirement age or (generally) to a disabled worker. This amount, which is related to the worker's average monthly wage or average indexed monthly earnings, is also the amount used as a base for computing all types of benefits payable on the basis of one individual's earnings record.

Primary-insurance-amount formula. The mathematical formula relating the PIA to the AIME for workers who attain age 62, become disabled, or die after 1978. The PIA is equal to the sum of 90 percent of AIME up to the first bend point, plus 32 percent of AIME above the first bend point up to the second bend point, plus 15 percent of AIME in excess of the second bend point. Automatic benefit increases are applied beginning with the year of eligibility. See table V.C2 for historical and assumed future bend points and table V.C1 for historical and assumed future benefit increases.

Quarters of coverage. Basic unit of measurement for determining insured status. In 2003, a worker receives one quarter of coverage (up to a total of four) for each $890 of annual covered earnings. The amount of earnings required for a quarter of coverage is subject to annual automatic increases in proportion to increases in average wages. For amounts applicable for years after 1978, see table V.C2.

Railroad retirement. A Federal insurance program, somewhat similar to Social Security, designed for workers in the railroad industry. The provisions of the Railroad Retirement Act provide for a system of coordination and

financial interchange between the Railroad Retirement program and the Social Security program.

Reallocation of tax rates. An increase in the tax rate payable to either the OASI or DI Trust Fund, with a corresponding reduction in the rate for the other fund, so that the total OASDI tax rate is not changed.

Real-wage differential. The difference between the percentage increases in (1) the average annual wage in covered employment and (2) the average annual Consumer Price Index. See table V.B1.

Recession. A period of adverse economic conditions; in particular, two or more successive calendar quarters of negative growth in gross domestic product.

Retired-worker benefit. A monthly benefit payable to a fully insured retired worker aged 62 or older or to a person entitled under the transitionally insured status provision in the law. Retired-worker benefit data do not include special age-72 benefits.

Retirement age. The age at which an individual establishes entitlement to retirement benefits. See "Normal retirement age."

Retirement earnings test. See "Earnings test."

Retirement test. See "Earnings test."

Self-employment. Operation of a trade or business by an individual or by a partnership in which an individual is a member.

Self-Employment Contributions Act–SECA. Provision authorizing Social Security taxes on the net earnings of most self-employed persons.

Short range. The next 10 years. Short-range actuarial estimates are prepared for this period because of the short-range test of financial adequacy. The Social Security Act requires estimates for 5 years; estimates are prepared for an additional 5 years to help clarify trends which are only starting to develop in the mandated first 5-year period.

Social Security Act. Provisions of the law governing most operations of the Social Security program. Original Social Security Act is Public Law 74-271, enacted August 14, 1935. With subsequent amendments, the Social Security Act consists of 20 titles, of which four have been repealed. The Old-Age, Survivors, and Disability Insurance program is authorized by title II of the Social Security Act.

Special public-debt obligation. Securities of the United States Government issued exclusively to the OASI, DI, HI, and SMI Trust Funds and other Federal trust funds. Section 201(d) of the Social Security Act provides that the public-debt obligations issued for purchase by the OASI and DI Trust Funds shall have maturities fixed with due regard for the needs of the funds. The usual practice in the past has been to spread the holdings of special issues, as of each June 30, so that the amounts maturing in each of the next 15 years

are approximately equal. Special public-debt obligations are redeemable at par value at any time and carry interest rates determined by law (see "Interest rate"). See tables III.A2 and III.A4 for a listing of the obligations held by the OASI and DI Trust Funds, respectively.

Statutory blindness. Central visual acuity of 20/200 or less in the better eye with the use of a correcting lens or tunnel vision of 20º or less.

Stochastic model. A model used for projecting a probability distribution of potential outcomes. Such models allow for random variation in one or more variables through time. The random variation is generally based on fluctuations observed in historical data for a selected period. Distributions of potential outcomes are derived from a large number of simulations, each of which reflects random variation in the variable(s).

Substantial gainful activity—SGA. The level of work activity used to establish disability. A finding of disability requires that a person be unable to engage in substantial gainful activity. A person who is earning more than a certain monthly amount (net of impairment-related work expenses) is ordinarily considered to be engaging in SGA. The amount of monthly earnings considered as SGA depends on the nature of a person's disability. The Social Security Act specifies a higher SGA amount for statutorily blind individuals; Federal regulations specify a lower SGA amount for non-blind individuals. Both SGA amounts increase with increases in the national average wage index.

Summarized balance. The difference between the summarized cost rate and the summarized income rate, expressed as a percentage of taxable payroll.

Summarized cost rate. The ratio of the present value of cost to the present value of the taxable payroll for the years in a given period, expressed as a percentage. This percentage can be used as a measure of the relative level of cost during the period in question. For purposes of evaluating the financial adequacy of the program, the summarized cost rate is adjusted to include the cost of reaching and maintaining a target trust fund level. Because a trust fund level of about 1 year's cost is considered to be an adequate reserve for unforeseen contingencies, the targeted trust fund ratio used in determining summarized cost rates is 100 percent of annual cost. Accordingly, the adjusted summarized cost rate is equal to the ratio of (a) the sum of the present value of the cost during the period plus the present value of the targeted ending trust fund level, to (b) the present value of the taxable payroll during the projection period.

Summarized income rate. The ratio of the present value of scheduled tax income to the present value of taxable payroll for the years in a given period, expressed as a percentage. This percentage can be used as a measure of the relative level of income during the period in question. For purposes of evaluating the financial adequacy of the program, the summarized income rate is

adjusted to include assets on hand at the beginning of the period. Accordingly, the adjusted summarized income rate equals the ratio of (a) the sum of the trust fund balance at the beginning of the period plus the present value of the total income from taxes during the period, to (b) the present value of the taxable payroll for the years in the period.

Supplemental Security Income—SSI. A Federally administered program (often with State supplementation) of cash assistance for needy aged, blind, or disabled persons. SSI is funded through the General Fund of the Treasury and administered by the Social Security Administration.

Supplementary Medical Insurance (SMI) Trust Fund. See "Trust fund."

Survivor benefit. Benefit payable to a survivor of a deceased worker.

Taxable earnings. Wages and/or self-employment income, in employment covered by the OASDI and/or HI programs, that is under the applicable annual maximum taxable limit. For 1994 and later, no maximum taxable limit applies to the HI program.

Taxable payroll. A weighted average of taxable wages and taxable self-employment income. When multiplied by the combined employee-employer tax rate, it yields the total amount of taxes incurred by employees, employers, and the self-employed for work during the period.

Taxable self-employment income. The maximum amount of net earnings from self employment by an earner which, when added to any taxable wages, does not exceed the contribution and benefit base. For HI beginning in 1994, all of net earnings from self employment.

Taxable wages. See "Taxable earnings."

Taxation of benefits. During 1984-93, up to one-half of an individual's or a couple's OASDI benefits was potentially subject to Federal income taxation under certain circumstances. The revenue derived from this provision was allocated to the OASI and DI Trust Funds on the basis of the income taxes paid on the benefits from each fund. Beginning in 1994, the maximum portion of OASDI benefits potentially subject to taxation was increased to 85 percent. The additional revenue derived from taxation of benefits in excess of one-half, up to 85 percent, is allocated to the HI Trust Fund.

Taxes. See "Contributions."

Termination. Cessation of payment of a specific type of benefit because the beneficiary is no longer entitled to receive it. For example, benefits might terminate as a result of the death of the beneficiary, the recovery of a disabled beneficiary, or the attainment of age 18 by a child beneficiary. In some cases, the individual may become immediately entitled to another type of benefit (such as the conversion of a disabled-worker beneficiary at normal retirement age to a retired-worker beneficiary).

Test of Long-Range Close Actuarial Balance. Summarized income rates and cost rates are calculated for each of 66 valuation periods within the full 75-year long-range projection period. The first of these periods consists of the next 10 years. Each succeeding period becomes longer by 1 year, culminating with the period consisting of the next 75 years. The long-range test is met if, for each of the 66 valuation periods, the actuarial balance is not less than zero or is negative by, at most, a specified percentage of the summarized cost rate for the same time period. The percentage allowed for a negative actuarial balance is 0 percent for the 10-year period, grading uniformly to 5 percent for the full 75-year period. The criterion for meeting the test is less stringent for the longer periods in recognition of the greater uncertainty associated with estimates for more distant years. The test is applied to OASI and DI separately, as well as combined, based on the intermediate set of assumptions.

Test of Short-Range Financial Adequacy. The conditions required to meet this test are as follows:

- If the trust fund ratio for a fund exceeds 100 percent at the beginning of the projection period, then it must be projected to remain at or above 100 percent throughout the 10-year projection period;
- Alternatively, if the fund ratio is initially less than 100 percent, it must be projected to reach a level of at least 100 percent within 5 years (and not be depleted at any time during this period) and then remain at or above 100 percent throughout the remainder of the 10-year period.

These conditions apply to each trust fund separately, as well as to the combined funds, and are evaluated based on the intermediate set of assumptions.

Total fertility rate. The average number of children who would be born to a woman in her lifetime if she were to experience the birth rates by age observed in, or assumed for, a specified year, and if she were to survive the entire childbearing period.

Trust fund. Separate accounts in the United States Treasury in which are deposited the taxes received under the Federal Insurance Contributions Act, the Self-Employment Contributions Act, contributions resulting from coverage of State and local government employees; any sums received under the financial interchange with the railroad retirement account; voluntary hospital and medical insurance premiums; and transfers of Federal general revenues. Funds not withdrawn for current monthly or service benefits, the financial interchange, and administrative expenses are invested in interest-bearing Federal securities, as required by law; the interest earned is also deposited in the trust funds.

- **Old-Age and Survivors Insurance (OASI).** The trust fund used for paying monthly benefits to retired-worker (old-age) beneficiaries and their spouses and children and to survivors of deceased insured workers.
- **Disability Insurance (DI).** The trust fund used for paying monthly benefits to disabled-worker beneficiaries and their spouses and children and for providing rehabilitation services to the disabled.
- **Hospital Insurance (HI).** The trust fund used for paying part of the costs of inpatient hospital services and related care for aged and disabled individuals who meet the eligibility requirements.
- **Supplementary Medical Insurance (SMI).** The trust fund used for paying part of the costs of physician's services, outpatient hospital services, and other related medical and health services for voluntarily enrolled aged and disabled individuals.

Trust fund ratio. A measure of the adequacy of the trust fund level. Defined as the assets at the beginning of the year, including advance tax transfers (if any), expressed as a percentage of the cost during the year. The trust fund ratio represents the proportion of a year's cost which could be paid with the funds available at the beginning of the year.

Unnegotiated check. A check which has not been cashed 6 months after the end of the month in which the check was issued. When a check has been outstanding for a year (i) the check is administratively cancelled by the Department of the Treasury and (ii) the issuing trust fund is reimbursed separately for the amount of the check and interest for the period the check was outstanding. The appropriate trust fund also receives an interest adjustment for the time the check was outstanding if it is cashed 6-12 months after the month of issue. If a check is presented for payment after it is administratively cancelled, a replacement check is issued.

Valuation period. A period of years which is considered as a unit for purposes of calculating the financial status of a trust fund.

Vocational rehabilitation. Services provided to disabled persons to help enable them to return to gainful employment. Reimbursement from the trust funds for the costs of such services is made only in those cases where the services contributed to the successful rehabilitation of the beneficiaries.

Year of exhaustion. The year in which a trust fund would become unable to pay benefits when due because the assets of the fund were exhausted.

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STATEMENT OF ACTUARIAL OPINION

It is my opinion that (1) the techniques and methodology used herein to evaluate the financial and actuarial status of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds are based upon sound principles of actuarial practice and are generally accepted within the actuarial profession; and (2) the assumptions used and the resulting actuarial estimates are, individually and in the aggregate, reasonable for the purpose of evaluating the financial and actuarial status of the trust funds, taking into consideration the past experience and future expectations for the population, the economy, and the program.

This report presents estimates for several additional measures of the unfunded obligation of the Social Security program that were not included in last year's report. These estimates are based on extensions of the assumptions and methods used for other projections shown in this report, and are consistent with them.

In addition, this report presents, for the first time, results of a new stochastic model for projecting probability distributions of financial measures for the Social Security program. Results presented from this model reflect the intermediate assumptions and methods of last year's report. It should be noted that the model is in its first stage of development and will continue to be improved and refined. As indicated in appendix E of this report, future model revisions are expected to reflect a fuller range of uncertainty about the future.

Stephen C. Goss,

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