

New securities at a total par value of \$107,766 million were acquired during the fiscal year through the investment of revenue and the reinvestment of funds made available from the redemption of securities. The par value of securities redeemed during the fiscal year was \$102,334 million. Thus, the net increase in the par value of the investments held by the fund during fiscal year 1993 amounted to \$5,432 million.

The effective annual rate of interest earned by the assets of the HI trust fund during the 12 months ending on June 30, 1993, was 9.01 percent. (This period is used because interest on special issues is paid semiannually on June 30 and December 31.) The interest rate on public-debt obligations issued for purchase by the trust fund in June 1993 was 6.25 percent, payable semiannually.

D. ACTUARIAL METHODOLOGY AND PRINCIPAL ASSUMPTIONS FOR THE HOSPITAL INSURANCE COST ESTIMATES

This section describes the basic methodology and assumptions used in the estimates for the HI program under the intermediate assumptions. In addition, sensitivity testing of program costs under two alternative sets of assumptions is presented.

1. Assumptions

Both the economic and demographic assumptions underlying the projections shown in this report are consistent with those in the 1994 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance (OASDI) Trust Funds. These assumptions are described in more detail in that report.

2. Program Cost Projection Methodology

The principal steps involved in projecting the future costs of the HI program are (1) establishing the present cost of services provided to beneficiaries, by type of service, to serve as a projection base; (2) projecting increases in payment amounts for inpatient hospital services under the program; (3) projecting increases in payment amounts for SNF, HHA, and hospice services covered under the program; and (4) projecting increases in administrative costs. The major emphasis is directed toward expenditures for inpatient

hospital services, which account for approximately 80 percent of total benefits.

a. Projection Base

In order to establish a suitable base from which to project the future costs of the program, the incurred payments for services provided must be reconstructed for the most recent period for which a reliable determination can be made. To do this, payments to providers must be attributed to dates of service, rather than to payment dates. In addition, the nonrecurring effects of any changes in regulations, legislation, or administration of the program and of any items affecting only the timing and flow of payments to providers must be eliminated. As a result, the rates of increase in the incurred cost of the program differ from the increases in cash disbursement shown in Tables I.C1 and I.C2.

For those expenses still reimbursed on a reasonable cost basis, the costs for covered services are determined on the basis of provider cost reports. Payments to a provider initially are made on an interim basis; to adjust interim payments to the level of retroactively determined costs, a series of payments or recoveries is effected through the course of cost settlement with the provider. The net amounts paid to date to providers in the form of cost settlements are known; however, the incomplete data available do not permit a precise determination of the exact amounts incurred during a specific period of time. Due to the time required to obtain cost reports from providers, to verify these reports, and to perform audits (where appropriate), final settlements have lagged behind the liability for such payments or recoveries by as much as several years for some providers. Hence, the final cost of services reimbursed on a reasonable cost basis has not been completely determined for the most recent years of the program, and some degree of uncertainty remains even for earlier years.

Even for inpatient hospital operating payments paid for on the basis of diagnosis-related groups (DRGs), most payments are initially made on an interim basis, and final payments are determined on the basis of bills containing detailed diagnostic information which are later submitted by the hospital.

Additional problems are posed by changes in legislation or regulation, or in administrative or reimbursement policy, which have a substantial effect on either the amount or incidence of payment. The extent and timing of the

incorporation of such changes into interim payment rates and cost settlement amounts cannot be determined precisely.

The process of allocating the various types of payments made under the program to the proper incurred period--using incomplete data and estimates of the impact of administrative actions--presents difficult problems, the solutions to which can be only approximate. Under the circumstances, the best that can be expected is that the actual incurred cost of the program for a recent period can be estimated within a few percent. This increases the projection error directly, by incorporating any error in estimating the base year into all future years.

b. Payments for Inpatient Hospital Costs

Beginning with hospital accounting years starting on or after October 1, 1983, the HI program began paying almost all participating hospitals a prospectively-determined amount for providing covered services to beneficiaries. With the exception of certain expenses reimbursed on a reasonable cost basis, as defined by law, the payment rate for each admission depends upon the DRG to which the admission belongs.

The law contemplates that the annual increase in the payment rate for each admission will be related to a hospital input price index, which measures the increase in prices for goods and services purchased by hospitals for use in providing care to hospital inpatients. In other literature, the hospital input price index is also called the hospital market basket percentage increase. For fiscal years through 1994, the prospective payment rates have already been determined. The projections contained in this report are based on the assumption that for fiscal years 1995 through 1997, the prospective payment rates will be increased in accordance with Public Law 103-66, the Omnibus Budget Reconciliation Act of 1993, and these legislated annual payment rate increases are indeed functions of the annual hospital input price indices. For fiscal years 1998 and later, current statute mandates that the annual increase in the payment rate per admission equal the annual hospital input price index.

Increases in aggregate payments for inpatient hospital care covered under the HI program can be analyzed into four broad categories:

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- (1) Labor factors--the increase in the hospital input price index which is attributable to increases in hospital workers' hourly earnings;
- (2) Non-labor factors--the increase in the hospital input price index which is attributable to factors other than hospital workers' hourly earnings, such as the costs of energy, food, and supplies;
- (3) Unit input intensity allowance--the increase in inpatient hospital payments per admission which are in excess of those attributable to increases in the hospital input price index; and
- (4) Volume of services--the increase in total output of units of service (as measured by hospital admissions covered by the HI program).

It has been possible to isolate some of these elements and to identify their roles in previous hospital payment increases. Table II.D1 shows the estimated values of the principal components of the increases for historical periods for which data are available and the projected trends used in the estimates. The following discussions apply to projections under the intermediate assumptions, unless otherwise indicated.

TABLE II.D1.--COMPONENTS OF HISTORICAL AND PROJECTED INCREASES IN HI INPATIENT HOSPITAL PAYMENTS¹
(Percent)

Calendar year	Labor			Non-labor			Units of service					
	Average hourly earnings	Hospital hourly earnings level	Hospital hourly earnings	CPI	Hospital price intensity	Non-labor prices	Input price index	Unit input intensity allowance ²	HI enrollment	Admission incidence	Other Sources	HI hospital payments
Historical Data:												
1983	4.1%	2.2%	6.4%	3.0%	0.1%	3.1%	5.1%	1.0%	1.7%	0.8%	2.3%	11.3%
1984	6.4	-0.7	5.7	3.5	0.1	3.6	4.9	1.0	1.8	-3.8	8.0	12.0
1985	5.4	-0.8	4.6	3.5	-1.0	2.5	3.8	0.0	1.6	-7.4	8.6	6.1
1986	5.3	-1.6	3.6	1.6	-0.6	1.0	2.6	-2.5	2.3	-5.6	7.4	3.8
1987	5.3	-1.3	3.9	3.6	-0.4	3.2	3.6	-2.5	1.7	-3.1	1.6	1.2
1988	4.4	0.4	4.8	4.0	1.3	5.4	5.0	-2.5	2.5	-2.2	1.4	4.2
1989	3.5	1.6	5.2	4.8	0.8	5.6	5.4	-1.4	2.0	-3.1	10.0	13.1
1990	5.3	0.2	5.5	5.2	-1.2	3.9	4.9	-0.1	2.1	-0.2	1.0	7.9
1991	4.2	0.5	4.7	4.0	-1.7	2.2	3.7	-0.5	2.2	0.4	3.9	10.0
1992	5.8	-1.8	3.9	2.9	-1.2	1.7	3.1	-0.2	1.9	2.3	2.9	10.4
Projection³:												
1993	4.0	-0.5	3.5	2.8	-0.7	2.1	3.0	-0.5	2.9	0.7	2.2	8.5
1994	3.0	0.7	3.7	2.7	0.7	3.4	3.6	-1.6	1.9	1.4	3.6	9.2
1995	5.0	0.4	5.4	3.2	0.0	3.2	4.6	-2.1	1.8	1.3	2.1	7.9
2000	4.9	0.4	5.3	3.9	0.0	3.9	4.8	0.0	1.3	1.1	2.4	9.9
2005	5.2	0.4	5.6	4.0	0.0	4.0	5.1	0.0	1.5	0.5	1.6	8.9
2010	5.2	0.4	5.6	4.0	0.0	4.0	5.1	0.0	1.8	0.1	1.0	8.2
2015	5.2	0.4	5.6	4.0	0.0	4.0	5.1	0.0	2.5	-0.1	1.1	8.8
2018	5.2	0.4	5.6	4.0	0.0	4.0	5.1	0.0	2.7	-0.1	1.0	8.9

¹Percent increase in year indicated over previous year, on an incurred basis.

²Reflects the allowances provided for in the prospective payment update factors.

³Under the intermediate assumptions.

Note: Historical and projected data reflect the hospital input price index which was recalibrated to a 1987 base year in 1990.

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Increases in hospital workers' hourly earnings can be analyzed and projected in terms of the assumed increases in hourly earnings in employment in the general economy and the difference between hourly earnings increases in the general economy and the proxy for hospital hourly earnings used in the hospital input price index. Since the beginning of the HI program, the differential between the proxy for hospital workers' hourly earnings and hourly earnings in the general economy has fluctuated widely. Since 1983, this differential has averaged about -0.1 percent. During the initial years of the prospective payment system, it appears that hospital hourly earnings were depressed relative to those in the general economy as hospitals adapted to the prospective payment system. This differential is assumed to fluctuate, leveling off at 0.4 percent over the short term, declining to zero just after the end of the first 25-year projection period.

Increases in hospital price input intensity, which are primarily the result of price increases for non-labor goods and services that hospitals purchase which do not parallel increases in the Consumer Price Index (CPI), are measured as the difference between the non-labor component of the hospital input price index and the CPI. Although the level has fluctuated erratically in the past, this differential has averaged about -0.4 percent during 1983-1992. Over the short term, hospital price input intensity is assumed to fluctuate, leveling off to zero for most of the projection period.

For years prior to the beginning of the prospective payment system, the unit input intensity allowance has been set at 1 percent for illustrative purposes, with historical increases in excess of 1 percent allocated to other sources. For years after the beginning of the prospective payment system, the unit input intensity allowance is the allowance provided for in the prospective payment update factor; that is, the unit input intensity allowance is the amount added onto (or subtracted from) the input price index to yield the update factor. (It should be noted that the update factors are generally prescribed on a fiscal year basis, while Table II.D1 is on a calendar year basis. Calculations have therefore been performed to estimate the unit input intensity allowance on a calendar year basis.) For fiscal years 1991-1997, the allowances shown are prescribed in Public Law 103-66. (Again, calculations were performed to show the unit input intensity allowance on a calendar year basis.) Beginning in fiscal year 1998, the law provides that future increases in payments to participating hospitals for covered admissions will equal the increase in the hospital input price index. Thus, the unit input intensity allowance, as

indicated in Table II.D1, is assumed to equal zero for the rest of the years in the first 25-year projection period.

Since the beginning of the prospective payment system, increases in inpatient hospital payments from other sources are primarily due to three factors: (1) the improvement in DRG coding as hospitals continue to adjust to the prospective payment system; (2) the trend toward treating less complicated (and thus, less expensive) cases in outpatient settings, resulting in an increase in the average prospective payment per admission; and (3) legislation affecting the payment rates. The effects of several budget reconciliation acts, sequesters as required by the Gramm-Rudman-Hollings Act, and other legislative effects are reflected in other sources, as appropriate. Some of the expansions in hospital payments due to the Medicare Catastrophic Coverage Act of 1988, and the subsequent reductions in hospital payments due to the Medicare Catastrophic Coverage Repeal Act of 1989, are reflected in other sources for 1989 to 1991. A 3 percent increase for fiscal year 1994, a 2 percent increase for fiscal years 1995 through 2005 and a 1 percent increase for fiscal years 2006 through 2018 reflected in other sources are attributable to a continuation of the current trend toward treating less complicated cases in outpatient settings and continued improvement in DRG coding. Additionally, part of the increase from other sources can be attributed to the increase in payments for certain costs not included in the DRG payment; these costs are generally increasing at a rate faster than the input price index. Possible other sources of both relative increases and decreases in payments include (1) a shift to more or less expensive admissions (DRGs) due to changes in the demographic characteristics of the covered population; (2) changes in medical practice patterns; and (3) adjustments in the relative payment levels for various DRGs or addition/deletion of DRGs in response to changes in technology. As experience under the prospective payment system continues to develop and is further analyzed, it may be possible to establish a predictable trend for this component.

Other factors which contribute to increases in payments for inpatient hospital services include increases in units (volume) of service as measured by increases in inpatient hospital admissions covered under the HI program. Increases in admissions are attributable both to increases in enrollment under the HI program and to increases in admission incidence (admissions per beneficiary). The historical and projected increases in enrollment reflect the more rapid increase in the population aged 65 and over than in the total population of the United States, and the coverage of certain disabled

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beneficiaries and persons with end-stage renal disease. Increases in the enrollment are expected to continue, reflecting a continuation of the demographic shift into categories of the population which are eligible for HI protection. In addition, increases in the average age of beneficiaries lead to higher levels of admission incidence. Admission incidence levels are also often affected by changes in the laws and regulations that define and guide the HI program's coverage of inpatient hospital care.

c. Skilled Nursing Facility (SNF), Home Health Agency (HHA), and Hospice Costs

Historical experience with the number of days of care covered in SNFs under the HI program has been characterized by wide swings. The number of covered days dropped very sharply in 1970 and continued to decline through 1972. This was the result of strict enforcement of regulations separating skilled nursing care from custodial care. Because of the small fraction of nursing home care covered under the program, this reduction primarily reflected the determination that Medicare was not liable for payment rather than reduced usage of services. The 1972 amendments extended benefits to persons who require skilled rehabilitative services regardless of their need for skilled nursing services (the former prerequisite for benefits). This change and subsequent related changes in regulations have resulted in significant increases in the number of services covered by the program. More recently, changes made in 1988 to coverage guidelines for SNF services and expansions and changes due to the Medicare Catastrophic Coverage Act of 1988, effective January 1, 1989, resulted in large increases in utilization of SNF services. For 1990, the estimates contained in this report reflect a reduction in utilization consistent with the SNF transition provisions of the Medicare Catastrophic Coverage Repeal Act of 1989; for 1991, the complete repeal of the catastrophic expansions and changes are reflected. In 1991 to 1993, large increases in SNF utilization occurred. Increases are projected to slow down in the near future, resulting in modest increases in covered days, based on growth and aging of the population.

Increases in the average cost per day (where cost is defined to be the total of program reimbursement and beneficiary cost sharing) in skilled nursing facilities under the program are caused principally by increasing payroll costs for nurses and other required skilled labor. For 1991 through 1993, extremely large rates of increase in cost per day occurred due to nursing home reform regulations. Projected rates of increase in cost per day are assumed to be

slightly lower than increases in general earnings throughout the projection period, but adjustments to reflect regulations limiting SNF cost per day are included where appropriate. Increases in reimbursement per day reflect the changes in beneficiary cost sharing amounts, including those changes resulting from the catastrophic coverage and catastrophic coverage repeal legislation.

The resulting increases in expenditures for SNF services are shown in Table II.D2.

TABLE II.D2. -- RELATIONSHIP BETWEEN INCREASES IN HI PROGRAM EXPENDITURES AND INCREASES IN TAXABLE PAYROLL ¹
(Percent)

Calendar year	Inpatient hospital ^{2,3}	Skilled nursing facility ³	Home health agency ³	Weighted average ^{3,4}	HI administrative costs ^{3,5}	HI program expenditures ^{3,5}	HI taxable payroll	Ratio of expenditures to payrolls ⁶
1994	9.2%	6.5%	25.9%	11.0%	48.0%	11.4%	12.1%	-0.6%
1995	8.0	5.9	18.3	9.3	7.2	9.2	6.2	2.9
2000	9.9	6.5	7.1	9.3	6.3	9.3	5.7	3.4
2005	8.9	6.4	6.7	8.5	6.1	8.5	5.9	2.5
2010	8.2	6.3	6.5	7.9	6.1	7.9	5.7	2.1
2015	8.8	6.5	6.6	8.4	6.6	8.4	5.4	2.9
2018	8.9	7.1	7.2	8.3	6.7	8.2	5.2	2.9

¹Percent increase in year indicated over previous year, under the intermediate assumptions.

²This column may differ slightly from the last column of Table II.D1, since Table II.D1 includes all persons eligible for HI protection while this table excludes noninsured persons.

³Costs attributable to insured beneficiaries only, on an incurred basis. Benefits and administrative costs for noninsured persons are expected to be financed through general revenue transfers and premium payments, rather than through payroll taxes.

⁴Includes costs for hospice care.

⁵Includes costs of Peer Review Organizations.

⁶Percent increase in the ratio of program expenditures to taxable payroll. This is equivalent to the differential between the increase in program costs and the increase in taxable payroll.

Program experience with HHA payments has shown a generally upward trend. The number of visits had increased sharply from year to year, but some decreases, albeit small in magnitude relative to past increases, were experienced in the mid-1980's; these were followed by modest increases. Recently, however, extremely large increases in the number of visits have occurred, and this trend is projected to gradually decline through 1996. Modest increases, based on growth and aging of the population, are projected thereafter. Reimbursement per visit is assumed to increase at a slightly lower rate than increases in general earnings, but adjustments to reflect regulations

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limiting HHA reimbursement per visit are included where appropriate. The resulting increases in expenditures for HHA services are shown in Table II.D2.

Coverage of certain hospice care for terminally ill beneficiaries is a relatively new program benefit, resulting from the enactment of the Tax Equity and Fiscal Responsibility Act of 1982, and payments for hospice care are very small relative to total program benefit payments. Detailed hospice data are, at this time, scant, but increases in hospice benefit payments are estimated based on daily payment rates and annual payment caps, as mandated by law and regulation, and modest growth in the number of covered days. Increases in hospice payments are not shown separately in Table II.D2 due to their extremely small contribution to the weighted average increase for all HI types of service, but are included in the average.

d. Administrative Expenses

The costs of administering the HI program have remained relatively small, in comparison with benefit amounts, throughout the history of the program. The ratio of administrative expenses to benefit payments has generally fallen within the range of 1 to 3 percent. The short-range projection of administrative cost is based on estimates of workloads and approved budgets for intermediaries and the Health Care Financing Administration. In the long range, administrative cost increases are based on assumed increases in workloads, primarily due to growth and aging of the population, and on assumed unit cost increases of slightly less than the increases in average hourly earnings shown in Table II.D1.

3. Financing Analysis Methodology

In order to analyze costs and to evaluate the financing of a program supported by payroll taxes, program costs must be compared on a year-by-year basis with the taxable payroll which provides most of the source of income for these costs. Since the vast majority of total program costs are related to insured beneficiaries and since general revenue appropriations and premium payments are expected to support the uninsured segments, the remainder of this report will focus on the financing for insured beneficiaries.

a. Taxable Payroll

Taxable payroll increases can be separated into a part due to increases in covered earnings and a part due to increases in the number of covered workers. The taxable payroll projection used in this report is based on economic assumptions consistent with those used in the OASDI report. Increases in taxable payroll assumed for this report are shown in Table II.D2.

b. Relationship Between Program Costs and Taxable Payroll

The single most meaningful measure of program cost increases, with reference to the financing of the system, is the relationship between program cost increases and taxable payroll increases. If program costs increase more rapidly than taxable payroll, either increasing income rates or reducing program costs (or some combination thereof) will be required to finance the system in the future. Table II.D2 shows the resulting increases in program costs relative to taxable payroll over the first 25-year projection period. These relative increases reduce gradually to a level of about 2 percent per year by 2010, but increase to a level of about 3 percent per year by 2018 for the intermediate assumption, just after the post-World War II "baby boom" population starts becoming eligible for benefits. The result of these increases is a continued increase in the year-by-year ratios of program expenditures to taxable payroll, as shown in Table II.D3.

TABLE II.D3. -- SUMMARY OF ALTERNATIVE PROJECTIONS FOR THE HI PROGRAM
(Percent)

Calendar year	Increases in aggregate HI inpatient hospital payments ¹				Changes in the relationship between expenditures and payroll ¹			
	Average hourly earnings	CPI	Other factors ²	Total ³	Program expenditures ^{3,4,5}	Taxable payroll	Ratio of expenditures to payroll	Expenditures as a percent of taxable payroll ^{3,4,5}
Intermediate:								
1994	3.0%	2.7%	6.1%	9.2%	11.4%	12.1%	-0.6%	3.23%
1995	5.0	3.2	3.4	7.9	9.2	6.2	2.9	3.32
2000	4.9	3.9	5.1	9.9	9.3	5.7	3.4	3.92
2005	5.2	4.0	3.9	8.9	8.5	5.9	2.5	4.52
2010	5.2	4.0	3.2	8.2	7.9	5.7	2.1	5.03
2015	5.2	4.0	3.8	8.8	8.4	5.4	2.9	5.80
2018	5.2	4.0	3.9	8.9	8.2	5.2	2.9	6.32

TABLE II.D3. -- SUMMARY OF ALTERNATIVE PROJECTIONS FOR THE HI PROGRAM
(Percent)

Calendar year	Increases in aggregate HI inpatient hospital payments ¹				Changes in the relationship between expenditures and payroll ¹			Expenditures as a percent of taxable payroll ^{3,4,5}
	Average hourly earnings	CPI	Other factors ²	Total ³	Program expenditures ^{3,4,5}	Taxable payroll	Ratio of expenditures to payroll	
Low Cost:								
1994	3.3%	2.4%	5.7%	8.8%	11.2%	13.0%	-1.6%	3.20%
1995	5.3	2.8	2.2	6.7	8.3	7.1	1.1	3.23
2000	4.6	3.0	3.7	7.9	7.7	5.8	1.8	3.50
2005	4.7	3.0	2.4	6.6	6.5	5.6	0.9	3.74
2010	4.6	3.0	1.5	5.7	5.8	5.3	0.5	3.84
2015	4.6	3.0	2.2	6.4	6.3	5.0	1.2	4.08
2018	4.6	3.0	2.3	6.5	6.0	4.9	1.0	4.23
High Cost:								
1994	2.9%	3.4%	6.0%	9.3%	11.6%	11.8%	-0.2%	3.24%
1995	4.2	4.0	4.7	9.0	10.2	4.3	5.7	3.43
2000	5.8	5.0	7.1	13.0	12.1	7.1	4.7	4.35
2005	5.8	5.0	5.6	11.4	10.6	6.2	4.2	5.45
2010	5.9	5.0	4.8	10.7	10.1	6.1	3.8	6.59
2015	5.9	5.0	5.4	11.3	10.8	5.7	4.8	8.30
2018	5.9	5.0	5.5	11.4	10.7	5.6	4.9	9.56

¹Percent Increase in the year indicated over the previous year.

²Other factors include hospital hourly earnings, hospital price input intensity, unit input intensity allowance, units of service as measured by admissions, and other sources.

³On an incurred basis.

⁴Includes expenditures attributable to insured beneficiaries only.

⁵Includes costs of Peer Review Organizations.

4. Sensitivity Testing of Costs Under Alternative Assumptions

Since the beginning of the program, aggregate inpatient hospital costs for Medicare beneficiaries have increased substantially faster than increases in average earnings and prices in the general economy. Table II.D1 shows the estimated experience of the HI program for 1983 to 1992. As mentioned earlier, the HI program now makes payments to most participating hospitals on a prospective basis (with the exception of certain expenses). The prospective payment system has made the outlays of the HI program potentially less vulnerable to excessive rates of growth in the hospital industry. However, there is some uncertainty in projecting HI expenditures, for inpatient hospital services as well as the other covered types of services, due to the uncertainty of the underlying economic assumptions and utilization increases. In addition, there is uncertainty in projecting HI expenditures due

to the possibility of future legislation affecting unit payment levels, particularly for inpatient hospital services. Current law is assumed throughout the estimates shown in this report, but legislation affecting the payment levels to hospitals has been enacted nearly annually for about the past 10 years, and future legislation is probable.

In view of the uncertainty of future cost trends, projected costs for the HI program have been prepared under three alternative sets of assumptions. A summary of the assumptions and results is shown in Table II.D3. The set of assumptions labeled "Intermediate" forms the basis for the detailed discussion of hospital cost trends and resulting program costs presented throughout this report. It represents intermediate cost increase assumptions, compared with the lower cost and higher cost alternatives. Increases in the economic factors (average hourly earnings and CPI) for the three alternatives are consistent with those underlying the OASDI report.

As noted earlier, the single most meaningful measure of HI program cost increases, with reference to the financing of the system, is the relationship between program cost increases and taxable payroll increases. The extent to which program cost increases exceed increases in taxable payroll will determine how steeply income rates must be increased or program costs curtailed to finance the system over time.

By the end of the first 25-year projection period, program costs are projected to increase about 3 percent faster per year than increases in taxable payroll for the intermediate assumption, as discussed in the "Financing Analysis Methodology" section. Program costs beyond the first 25-year projection period are based on the assumption that costs per unit of service increase at the same rate as average hourly earnings increase. Program expenditures, which were about 3 percent of taxable payroll in 1993, increase to a level of about 6 percent by the year 2018 and to over 11 percent by the year 2068 under the intermediate assumptions. Hence, if all of the projection assumptions are realized over time, the HI income rates provided in current law (3.2 percent of taxable payroll) will be grossly inadequate to support the cost of the program.

During the first 25-year projection period, the low cost and high cost alternatives contain assumptions which result in program costs increasing, relative to taxable payroll increases, approximately 2 percent less rapidly and 2 percent more rapidly, respectively, than the results under the intermediate assumptions. Costs beyond the first 25-year projection period assume the 2 percent differential gradually decreases until the year 2043 when program cost increases relative to taxable payroll are approximately the same as under the intermediate assumptions. Under the low cost alternative, program costs

increase about 1.1 percent more per year than increases in taxable payroll during the first 25-year projection period. Program expenditures under this alternative would be about 4.2 percent of taxable payroll in the year 2018, increasing to about 5.8 percent of taxable payroll by 2068. The summarized program cost rate for the 75-year projection period is about 4.5 percent of taxable payroll and the summarized income rate is about 3.1 percent of taxable payroll; hence, HI income rates provided in current law will be inadequate even under the low cost alternative. Under the high cost alternative, program costs increase about 4.4 percent more rapidly per year than increases in taxable payroll during the first 25-year projection period. The result of this differential is a level of program expenditures in the year 2018 which is about 9.6 percent of taxable payroll, increasing to about 21.7 percent of taxable payroll in the year 2068. The summarized program cost rate for the 75-year projection period is about 12.5 percent of taxable payroll. The summarized income rate is about 3.3 percent of taxable payroll.

E. LONG-RANGE SENSITIVITY ANALYSIS

This section presents estimates which illustrate the sensitivity of the long-range actuarial balance of the HI program to changes in selected individual assumptions. The estimates based on the three alternative sets of assumptions 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 HI program. In the sensitivity analysis presented in this section, the intermediate alternative is used as the reference point, and one assumption at a time is varied within that alternative. Similar variations in the selected assumptions within the other alternatives would result in similar variations in the long-range estimates.

Each table that follows shows the effects of changing a particular assumption on the HI summarized income rates, summarized cost rates, and actuarial balances (as defined earlier in this report) for 25-year, 50-year, and 75-year valuation periods. Because the income rate varies only slightly with changes in assumptions, it is not considered in the discussion of the tables. The change in each of the actuarial balances is approximately equal to the change in the corresponding cost rate, but in the opposite direction.

1. Real-Wage Differential

Table II.E1 shows the estimated HI income rates, cost rates, and actuarial balances, on the basis of the intermediate assumptions with various assumptions about the real-wage differential. These assumptions are that the ultimate real-wage differential will be 0.5 percentage point (as assumed for the

high cost alternative), 1.0 percentage point (as assumed for the intermediate assumptions), and 1.5 percentage points (as assumed for the low cost alternative). In each case, the ultimate annual increase in the CPI is assumed to be 4.0 percent (as assumed for the intermediate assumptions), yielding ultimate percentage increases in average annual wages in covered employment of 4.5, 5.0, and 5.5 percent under the high cost, intermediate, and low cost alternatives, respectively.

For the 25-year period, the cost rate decreases from 4.85 percent (for a real-wage differential of 0.5 percentage point) to 4.54 percent (for a differential of 1.5 percentage points). For the 50-year period, it decreases from 6.65 to 6.06 percent, and for the 75-year period it decreases from 7.80 to 6.92 percent. The actuarial balance increases from -1.77 to -1.48 percent for the 25-year period, from -3.47 to -2.92 percent for the 50-year period, and from -4.57 to -3.73 percent for the 75-year period.

TABLE II.E1. -- ESTIMATED HI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON INTERMEDIATE ESTIMATES WITH VARIOUS REAL-WAGE ASSUMPTIONS
(As a percentage of taxable payroll)

Valuation Period	Ultimate percentage increase in wages-CPI ¹		
	4.5-4.0	5.0-4.0	5.5-4.0
Summarized income rate:			
25-year: 1994-2018	3.08	3.07	3.06
50-year: 1994-2043	3.18	3.16	3.14
75-year: 1994-2068	3.23	3.21	3.19
Summarized cost rate:			
25-year: 1994-2018	4.85	4.68	4.54
50-year: 1994-2043	6.65	6.34	6.06
75-year: 1994-2068	7.80	7.35	6.92
Actuarial balance:			
25-year: 1994-2018	-1.77	-1.61	-1.48
50-year: 1994-2043	-3.47	-3.18	-2.92
75-year: 1994-2068	-4.57	-4.14	-3.73

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

The cost rate decreases with increasing real-wage differentials, because the higher real-wage levels increase the taxable payroll to a greater extent than they increase the benefits. Under the current financial status of the HI trust fund, each 0.5-percentage-point increase in the assumed real-wage differential increases the long-range actuarial balance by about 0.42 percent of taxable payroll.

2. Consumer Price Index

Table II.E2 shows the estimated HI income rates, cost rates, and actuarial balances, on the basis of the intermediate alternative 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 3.0 percent (as assumed for the low cost alternative), 4.0 percent (as assumed for the intermediate assumptions), and 5.0 percent (as assumed for the high cost alternative). In each case, the ultimate real-wage differential is assumed to be 1.0 percentage point (as assumed for the intermediate assumptions), yielding ultimate percentage increases in average annual wages in covered employment of 4.0, 5.0, and 6.0 percent under the low cost, intermediate, and high cost alternatives, respectively.

TABLE II.E2. -- ESTIMATED HI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON INTERMEDIATE ESTIMATES WITH VARIOUS CPI-INCREASE ASSUMPTIONS

(As a percentage of taxable payroll)

Valuation Period	Ultimate percentage increase in wages-CPI ¹		
	4.0-3.0	5.0-4.0	6.0-5.0
Summarized income rate:			
25-year: 1994-2018	3.07	3.07	3.06
50-year: 1994-2043	3.16	3.16	3.14
75-year: 1994-2068	3.21	3.21	3.19
Summarized cost rate:			
25-year: 1994-2018	4.71	4.68	4.63
50-year: 1994-2043	6.39	6.34	6.25
75-year: 1994-2068	7.42	7.35	7.24
Actuarial balance:			
25-year: 1994-2018	-1.64	-1.61	-1.57
50-year: 1994-2043	-3.23	-3.18	-3.11
75-year: 1994-2068	-4.21	-4.14	-4.05

¹The first value in each pair is the assumed ultimate annual percentage increase in average wages in covered employment. The second value is the assumed ultimate annual percentage increase in the Consumer Price Index.

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 4.71 percent (for CPI increases of 3.0 percent) to 4.63 percent (for CPI increases of 5.0 percent). For the 50-year period, it decreases from 6.39 to 6.25 percent, and for the 75-year period it decreases from 7.42 to 7.24 percent. The actuarial balance increases from -1.64 to -1.57 percent for the 25-year period, from -3.23 to -3.11 percent for the 50-year period, and from -4.21 to -4.05 percent for the 75-year period.

The patterns described above result primarily from the fact that the fiscal year 1994 payment rates for hospitals have already been set. If the 1994 payments were allowed to be effected by CPI changes, there would be no change due to CPI changes. Since these payments have been set, 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 0.08 percent of taxable payroll.

3. Real-Interest Rate

Table II.E3 shows the estimated HI income rates, cost rates, and actuarial balances, on the basis of the intermediate alternative with various assumptions about the annual nominal real-interest rate for special public-debt obligations issuable to the trust fund, which are compounded semiannually. These assumptions are that the ultimate annual real-interest rate will be 1.5 percent (as assumed for the high cost alternative), 2.3 percent (as assumed for the intermediate assumptions), and 3.0 percent (as assumed for the low cost alternative). In each case, the ultimate annual increase in the CPI is assumed to be 4.0 percent (as assumed for the intermediate assumptions), resulting in ultimate annual yields of 5.6, 6.4, and 7.1 percent under the high cost, intermediate, and low cost alternatives, respectively.

TABLE II.E3. -- ESTIMATED HI INCOME RATES, COST RATES, AND ACTUARIAL BALANCES, BASED ON INTERMEDIATE ESTIMATES WITH VARIOUS REAL-INTEREST ASSUMPTIONS
(As a percentage of taxable payroll)

Valuation Period	Ultimate annual real-interest rate		
	1.5 percent	2.3 percent	3.0 percent
Summarized income rate:			
25-year: 1994-2018	3.07	3.07	3.06
50-year: 1994-2043	3.17	3.16	3.15
75-year: 1994-2068	3.23	3.21	3.19
Summarized cost rate:			
25-year: 1994-2018	4.75	4.68	4.61
50-year: 1994-2043	6.58	6.34	6.10
75-year: 1994-2068	7.76	7.35	6.95
Actuarial balance:			
25-year: 1994-2018	-1.68	-1.61	-1.55
50-year: 1994-2043	-3.41	-3.18	-2.95
75-year: 1994-2068	-4.53	-4.14	-3.76

For the 25-year period, the cost rate decreases with increasing real-interest rates from 4.75 percent (for an ultimate real-interest rate of 1.5 percent) to 4.61 percent (for an ultimate real-interest rate of 3.0 percent). For the 50-year period, it decreases from 6.58 to 6.10 percent, and for the 75-year period

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it decreases from 7.76 to 6.95 percent. The actuarial balance increases from -1.68 to -1.55 percent for the 25-year period, from -3.41 to -2.95 percent for the 50-year period, and from -4.53 to -3.76 percent for the 75-year period. Each 1.0-percentage point increase in the assumed real-interest rate increases the long-range actuarial balance by about 0.50 percent of taxable payroll. The fact that the actuarial balance of the HI program is sensitive to the interest assumption is not an indication of the actual role that interest plays in the financing of the HI program. In actuality, interest finances very little of the cost of the HI program. The sensitivity of the actuarial balance to the interest assumption is implicit in the present-value method used to calculate the actuarial balance.